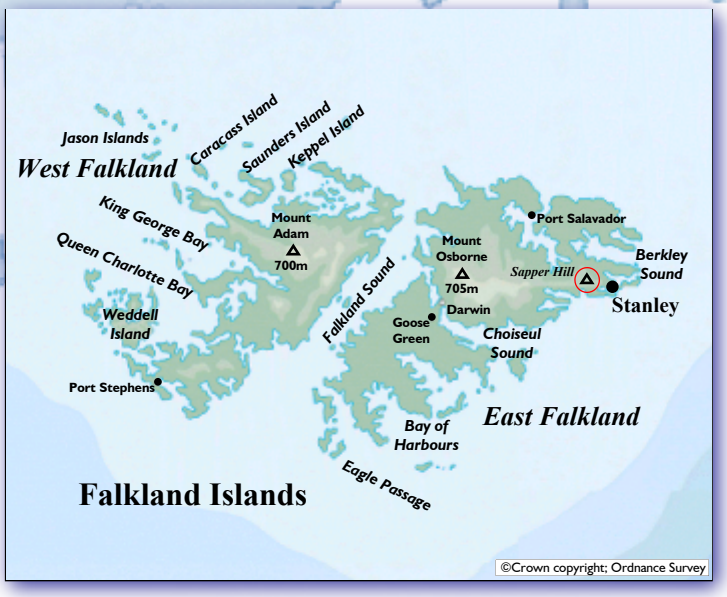
BRITISH GEOLOGICAL SURVEY

Port Stanley Observatory *Monthly Magnetic Bulletin*

October 2007

07/10 /PS



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

PORT STANLEY OBSERVATORY MAGNETIC DATA

1. Introduction

Port Stanley Observatory was installed by BGS with financial support from a consortium of oil companies and became operational in February 1994.

This bulletin is published to meet the needs of users of geomagnetic data. Magnetic observatory data is presented as a series of plots of one-minute, hourly and daily values, followed by a tabulation of monthly values. The operation of the observatory and presentation of data are described in the rest of this section.

Enquiries about the data should be addressed to:

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British Geological Survey
Murchison House, West Mains Road
Edinburgh EH9 3LA
Scotland, UK

Tel: +44 (0) 131 667 1000
Fax: +44 (0) 131 650 0265
E-mail: orba@bgs.ac.uk
Internet: *www.geomag.bgs.ac.uk*

2. Position

Port Stanley Observatory, one of the geomagnetic observatories maintained and operated by the British Geological Survey (BGS), is situated on a site at Sapper Hill near Port Stanley in the Falkland Islands. The observatory co-ordinates are:

Geographic:	*51°42.2′S*	*302°06.6′E*
Geomagnetic:	*41°41.2′S*	*11°27.5′E*
Height above mean sea level:		*135 m*

The geomagnetic co-ordinates are calculated using the 10th generation International Geomagnetic Reference Field at epoch 2007.5.

3. The Observatory Operation

3.1 GDAS

The observatory operates under the control of the Geomagnetic Data Acquisition System (GDAS), developed by BGS, which was installed in August 2002. The system operates under the control of data acquisition software running on QNX computers, which control the data logging and communications.

There are two sets of sensors used for making magnetic measurements. A triaxial linear-core fluxgate magnetometer, manufactured by the Danish Meteorological Institute, is used to measure the variations in the horizontal (*H*) and vertical (*Z*) components of the field. The third sensor is oriented perpendicular to these, and measures variations, which are proportional to the changes in declination (*D*). Measurements are made at a rate of 1 Hz.

In addition to the fluxgate sensors there is a proton precession magnetometer making measurements of the absolute total field intensity (*F*) at a rate of 0.1Hz.

The raw unfiltered data are retrieved automatically via Internet connections to the BGS office in Edinburgh in near real-time. The fluxgate data are filtered to produce one-minute values using a 61-point cosine filter whilst the total field intensity samples are filtered using a 7-point cosine filter.

3.2 Absolute Observations

The GDAS fluxgate magnetometers accurately measure variations in the components of the geomagnetic field, but not the absolute magnitudes. Two sets of absolute measurements of the field are made manually once per week. A fluxgate sensor mounted on a theodolite is used to determine *D* and inclination (*I*); the GDAS PPM measurements, with a site difference correction applied, are used for *F*. The absolute observations are used in conjunction with the GDAS variometer measurements to produce a continuous record of the absolute values of the geomagnetic field elements as if they had been measured at the observatory reference pillar.

4. Data Presentation

The data presented in the bulletin are in the form of plots and tabulations described in the following sections.

4.1 Absolute Observations

The absolute observation measurements made during the month are tabulated. Also included are the corresponding baseline values, which are the differences between the absolute measurements and the variometer measurements of *D*, *H* and *Z* (in the sense absolute−variometer). These are also plotted (markers) along with the derived preliminary daily baseline values (line) throughout the year. Daily mean differences between the measured absolute *F* and the *F* computed from the baseline corrected *H* and *Z* values are plotted in the fourth panel (in the sense measured−derived). The bottom panel shows the daily mean temperature in the fluxgate chamber.

4.2 Summary magnetograms

Small-scale magnetograms are plotted which allow the month's data to be viewed at a glance. They are plotted 16 days a page and show the variations in *D*, *H* and Z. The scales are shown on the right-hand side of the page. On disturbed days the scales are multiplied by a factor, which is indicated above the panel for that day. The variations are centred on the monthly mean value, shown on the left side of the page.

4.3 Magnetograms

The daily magnetograms are plotted using one-minute values of *D*, *H* and *Z* from the fluxgate sensors, with any gaps filled using back-up data. The magnetograms are plotted to a variable scale; scale bars are shown to the right of each plot. The absolute level (the monthly mean value) is indicated on the left side of the plots.

4.4 Hourly Mean Value Plots

Hourly mean values of *D*, *H* and *Z* for the past 12 months are plotted in 27-day segments corresponding to the Bartels solar rotation number. Magnetic disturbances associated with active regions on the surface of the Sun may recur after 27 days: the same is true for geomagnetically quiet intervals. Plotting the data in this way highlights this recurrence, and also illustrates seasonal and diurnal variations throughout the year.

4.5 Daily and Monthly Mean Values

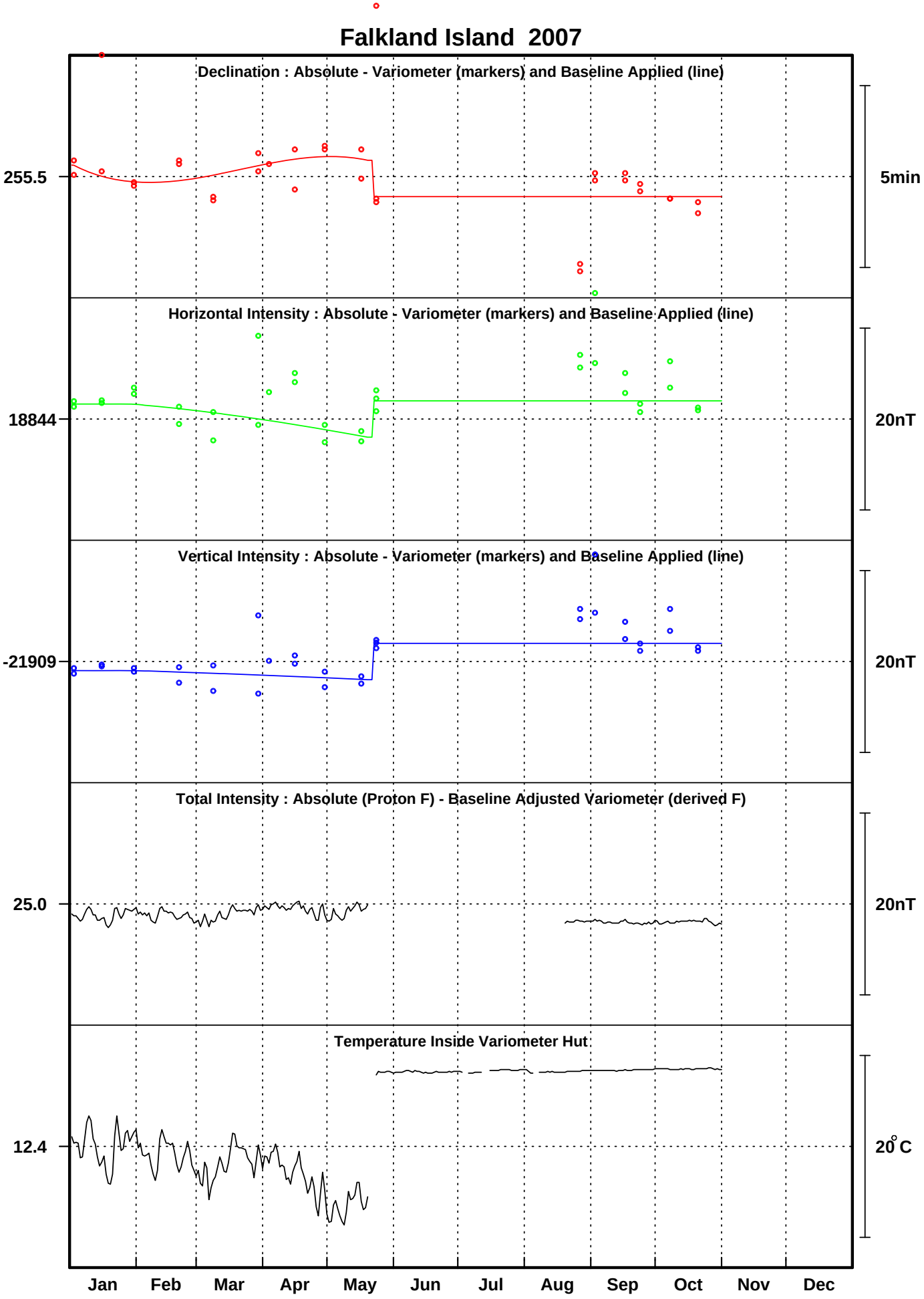
Daily mean values of *D*, *H*, *Z* and *F* are plotted throughout the year. In addition, a table of monthly mean values of all the geomagnetic elements is provided. These values depend on accurate specification of the fluxgate sensor baselines. This data is provisional. It is anticipated that provisional values will not be altered by more than a few nT or tenths of arcminutes before being made definitive.

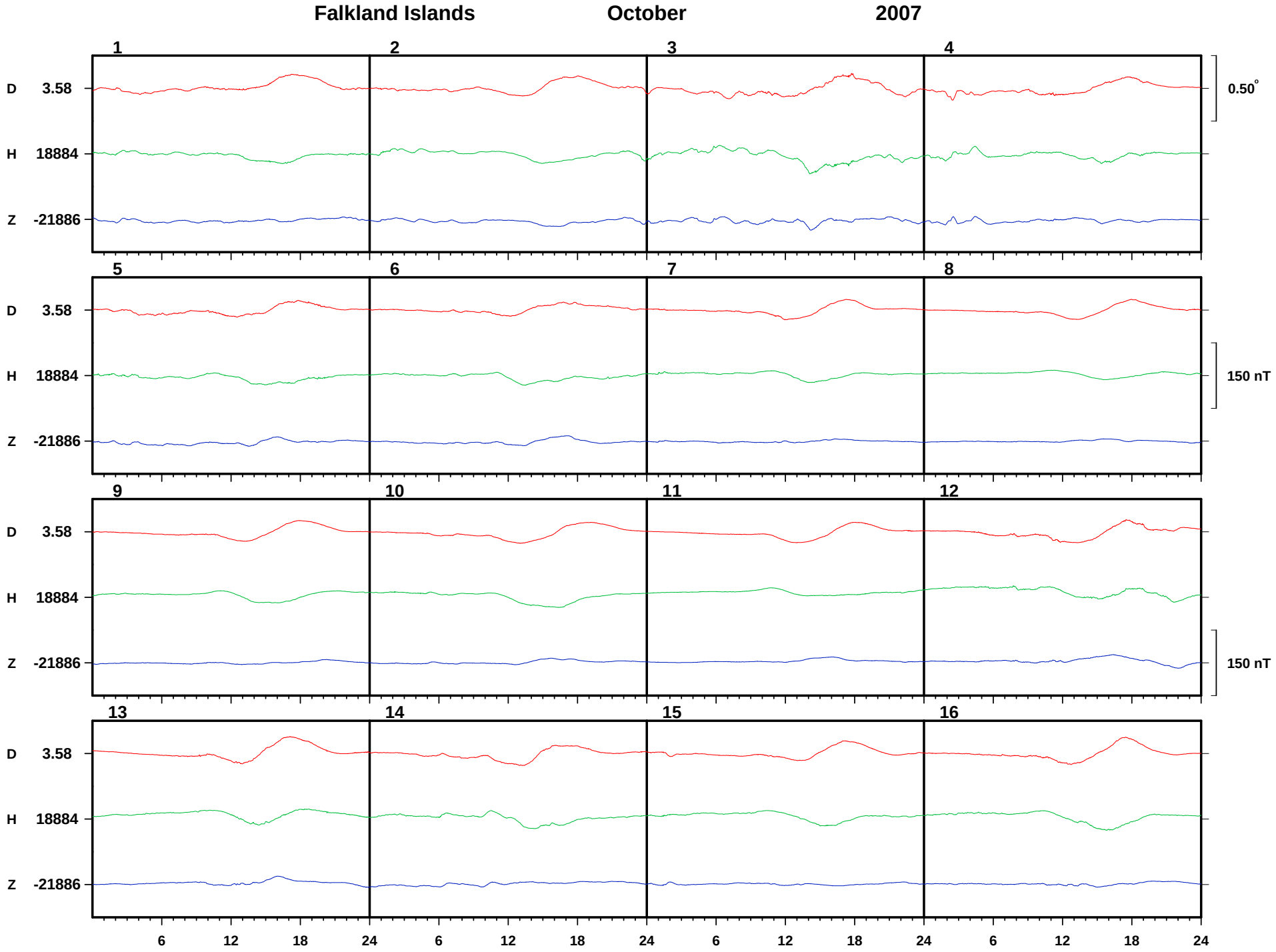
PORT STANLEY OBSERVATORY

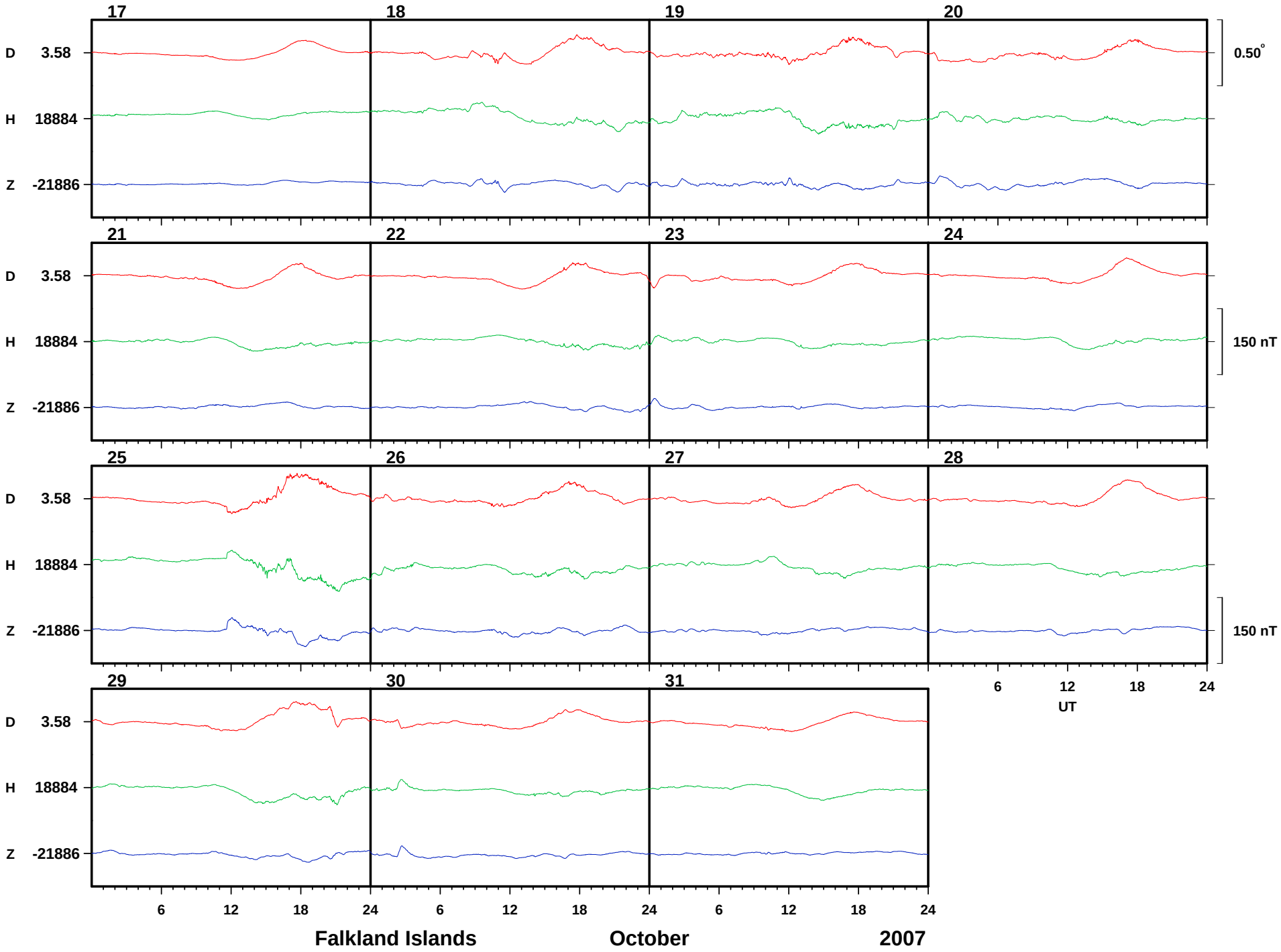
ABSOLUTE OBSERVATIONS

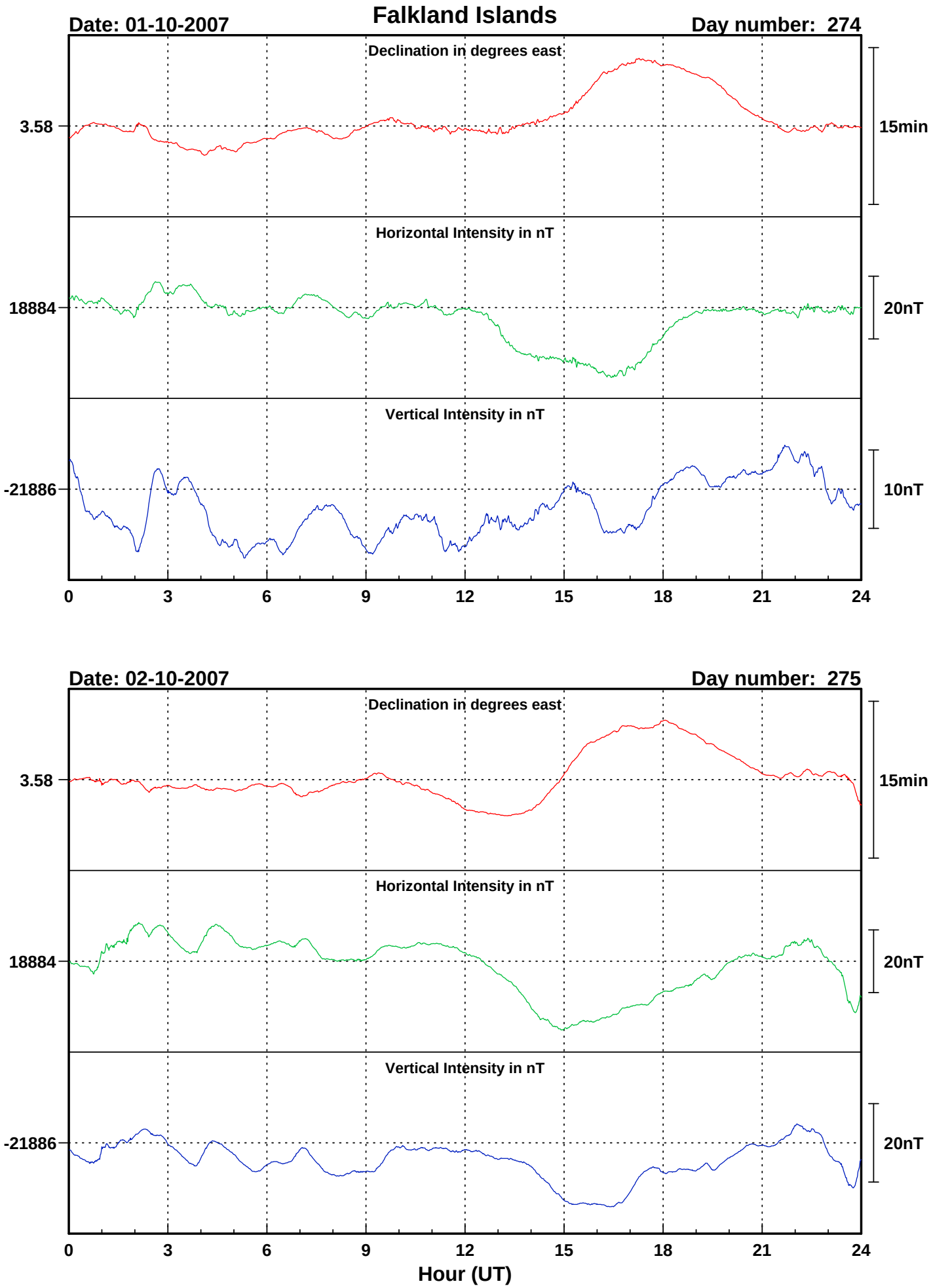
		DECLINATION			INCLINATION							
Date	**Day Number**	**Time (UT)**	**Absolute (º)**	**Baseline (º)**	**Time (UT)**	**Inclination (º)**	**Total Field Intensity (nT)**	**H Absolute (nT)**	**H Baseline (nT)**	**Z Absolute (nT)**	**Z Baseline (nT)**	**Observer**
07-Oct-07	280	16:43	3.6491	3.5917	16:50	-49.2078	28901.6	18882.0	18868.2	-21880.9	-21780.6	NB
07-Oct-07	280	16:55	3.6539	3.5917	17:03	-49.1971	28902.7	18886.7	18871.1	-21878.2	-21778.2	NB
20-Oct-07	293	12:19	3.5228	3.5850	12:29	-49.2125	28900.1	18879.1	18866.0	-21881.3	-21782.4	NB
20-Oct-07	293	12:37	3.5245	3.5900	12:46	-49.2091	28897.6	18878.8	18865.7	-21878.4	-21782.8	NB

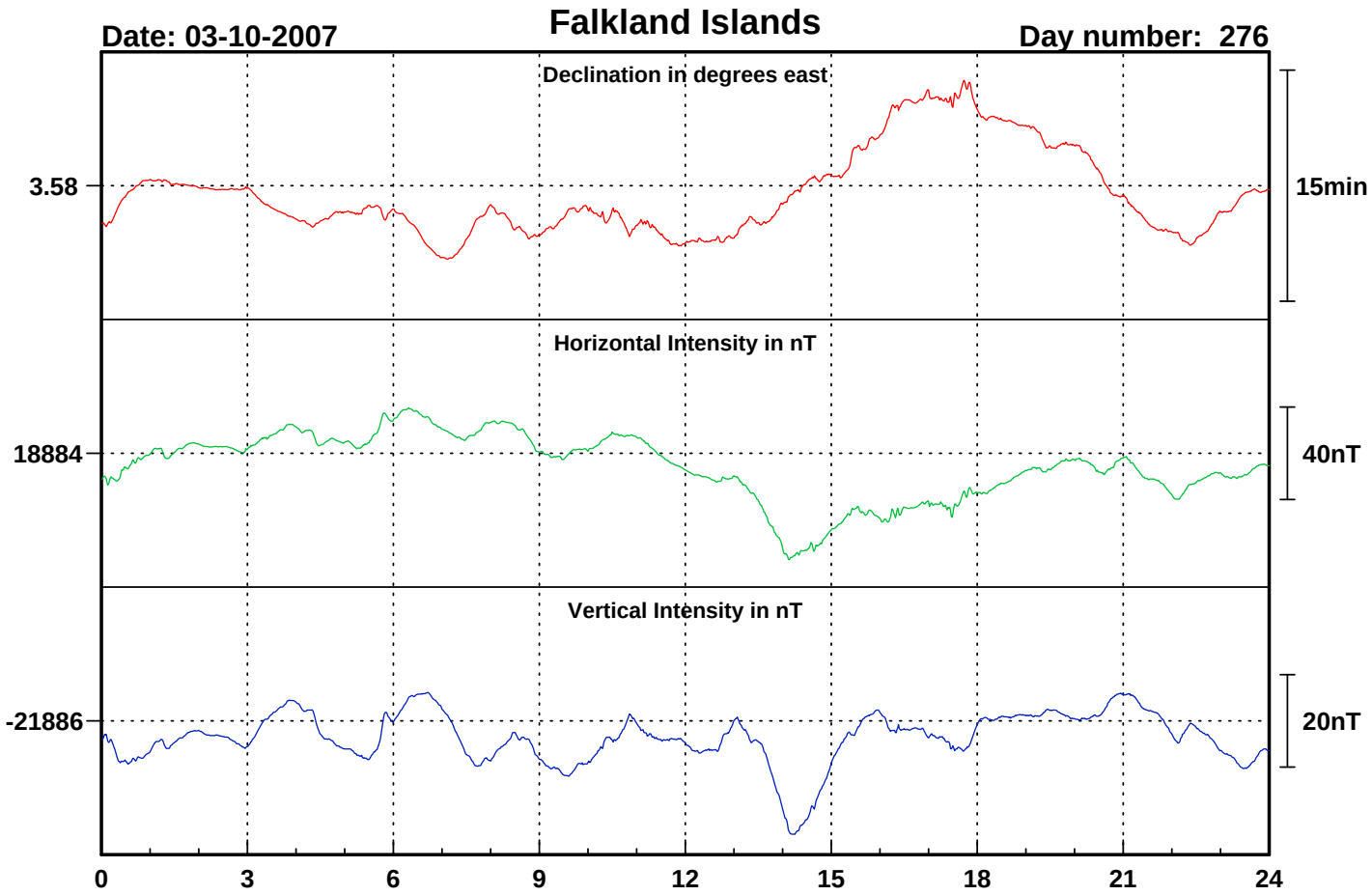
Falkland Island 2007

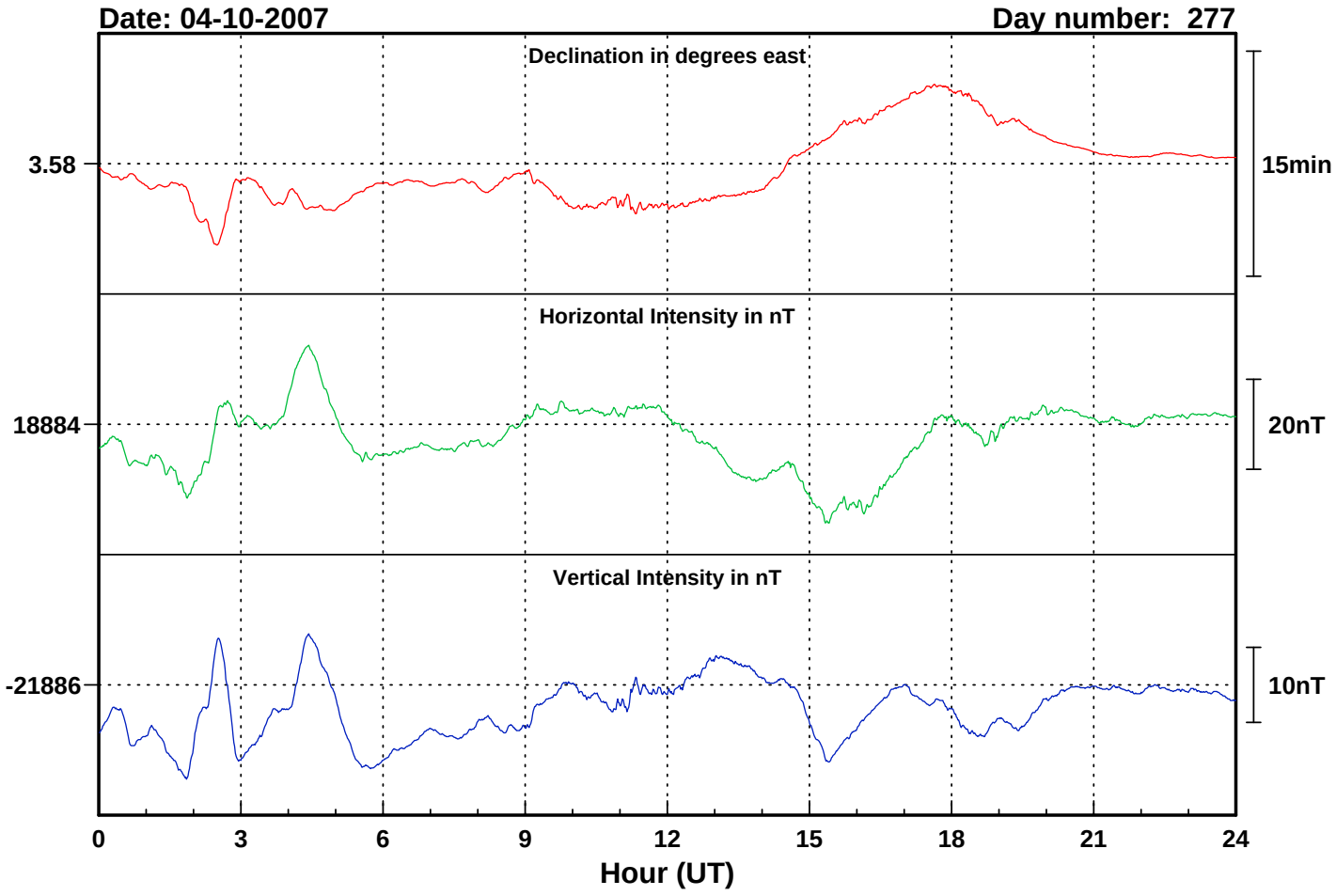



Falkland Islands
October
2007
1
2
3
4
D 3.58
H 18884
Z -21886
0.50°
5
6
7
8
D 3.58
H 18884
Z -21886
150 nT
9
10
11
12
D 3.58
H 18884
Z -21886
150 nT
13
14
15
16
D 3.58
H 18884
Z -21886
6
12
18
24
6
12
18
24
6
12
18
24
6
12
18
24


17
18
19
20
D 3.58
H 18884
Z -21886
0.50°
21
22
23
24
150 nT
25
26
27
28
29
30
31
6
12
18
24
UT
Falkland Islands
October
2007


Falkland Islands
Date: 01-10-2007
Day number: 274
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Date: 02-10-2007
Day number: 275
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
20nT
0
3
6
9
12
15
18
21
24
Hour (UT)


Falkland Islands
Date: 03-10-2007
Day number: 276
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
40nT
Vertical Intensity in nT
-21886
20nT
0
3
6
9
12
15
18
21
24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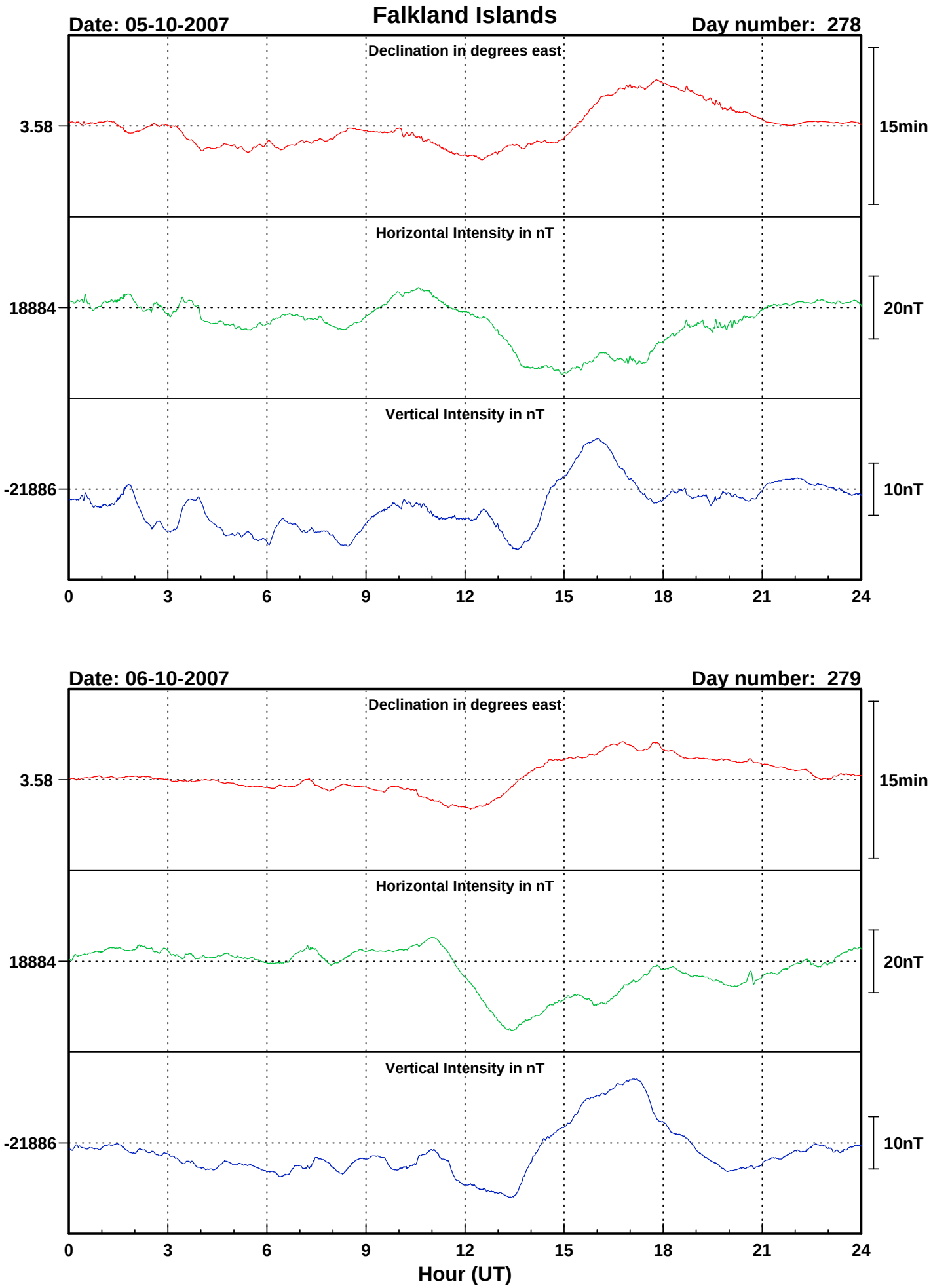
Day number: 277
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Hour (UT)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Day number: 278
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Date: 06-10-2007
Day number: 279
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
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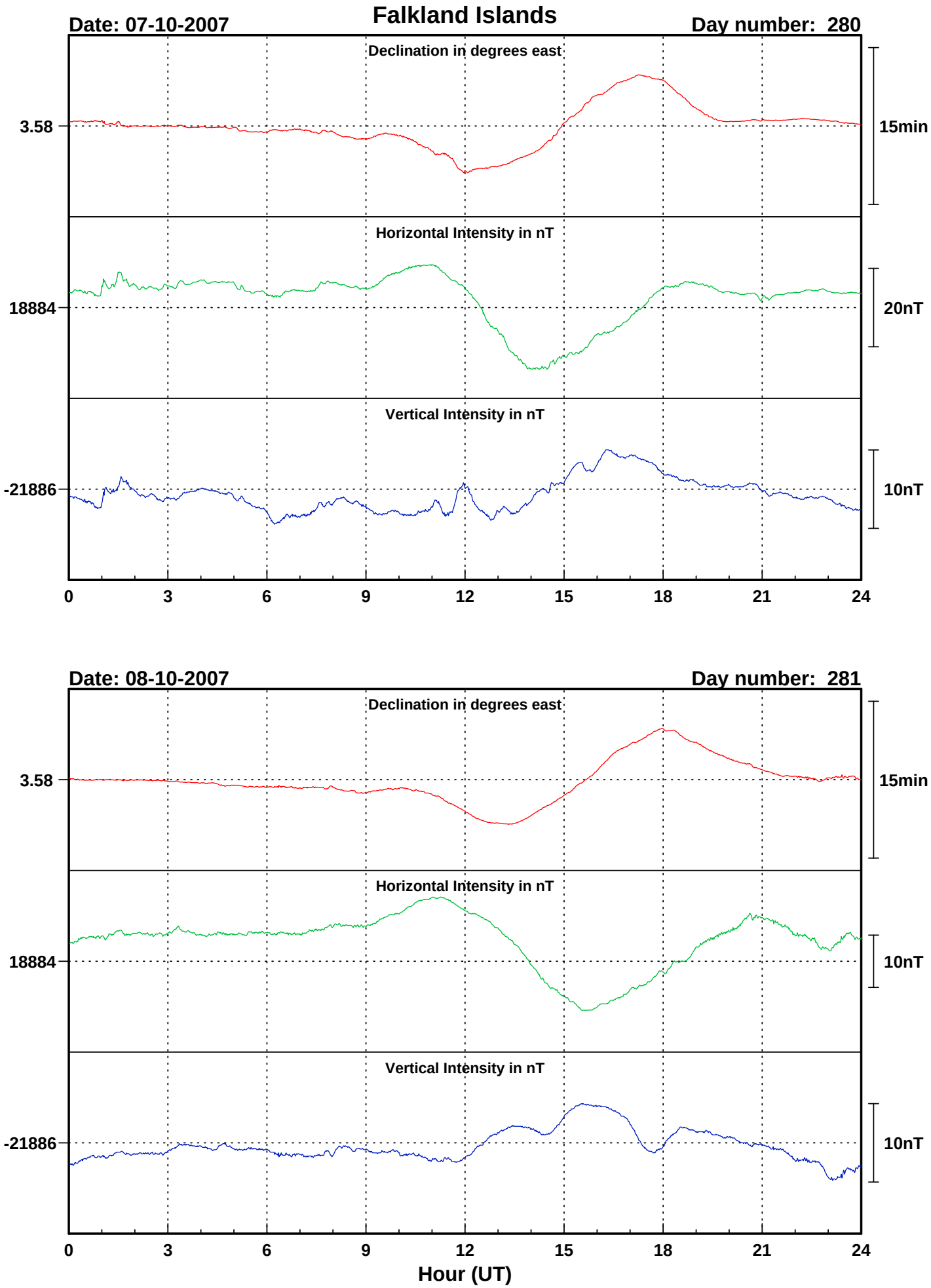
6
9
12
15
18
21
24
Hour (UT)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Date: 07-10-2007
Day number: 280
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Date: 08-10-2007
Day number: 281
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
10nT
Vertical Intensity in nT
-21886
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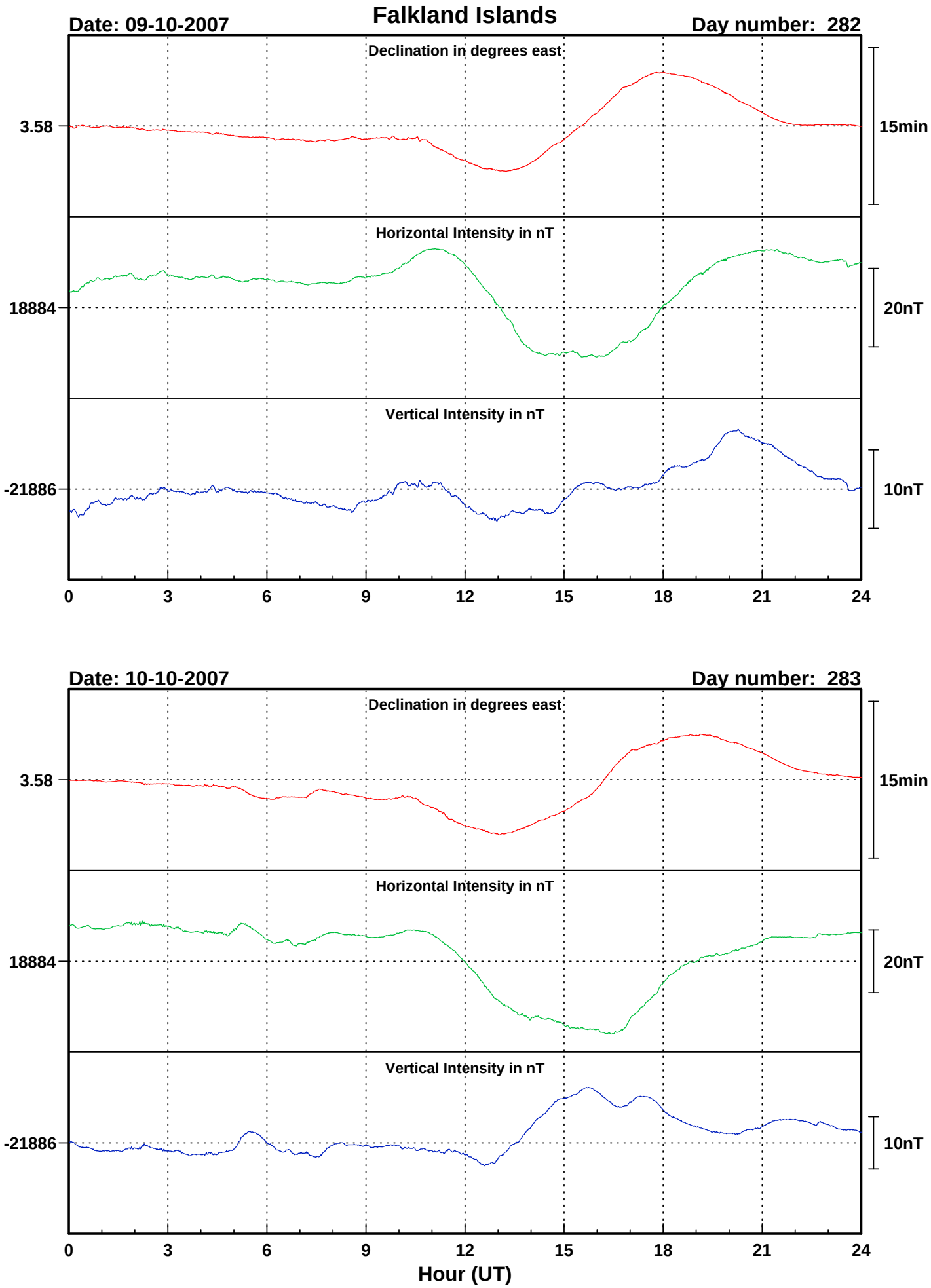
6
9
12
15
18
21
24
Hour (UT)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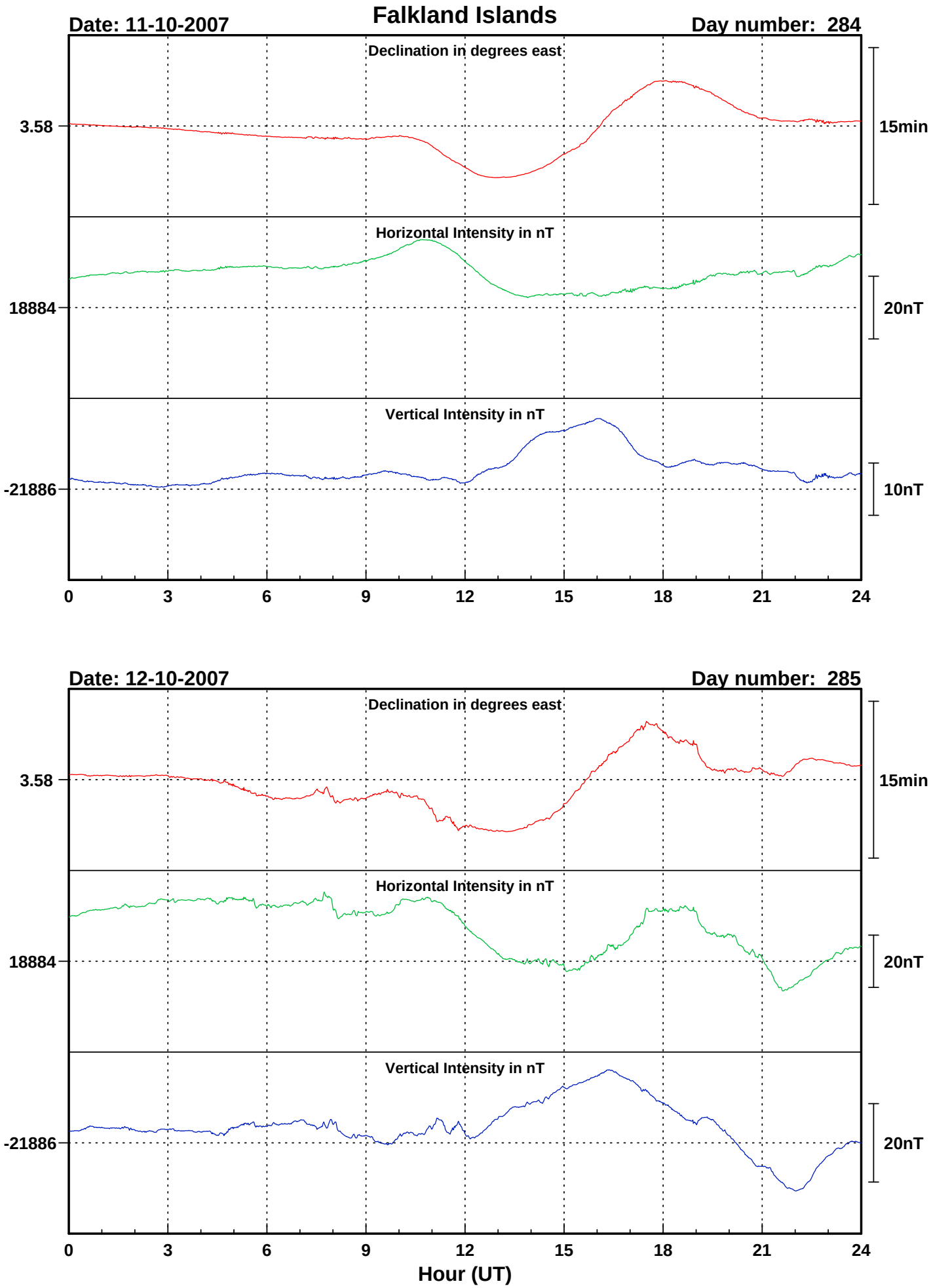
Date: 09-10-2007
Day number: 282
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Date: 10-10-2007
Day number: 283
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Hour (UT)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Date: 11-10-2007
Day number: 284
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Date: 12-10-2007
Day number: 285
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
20nT
0
3
6
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18
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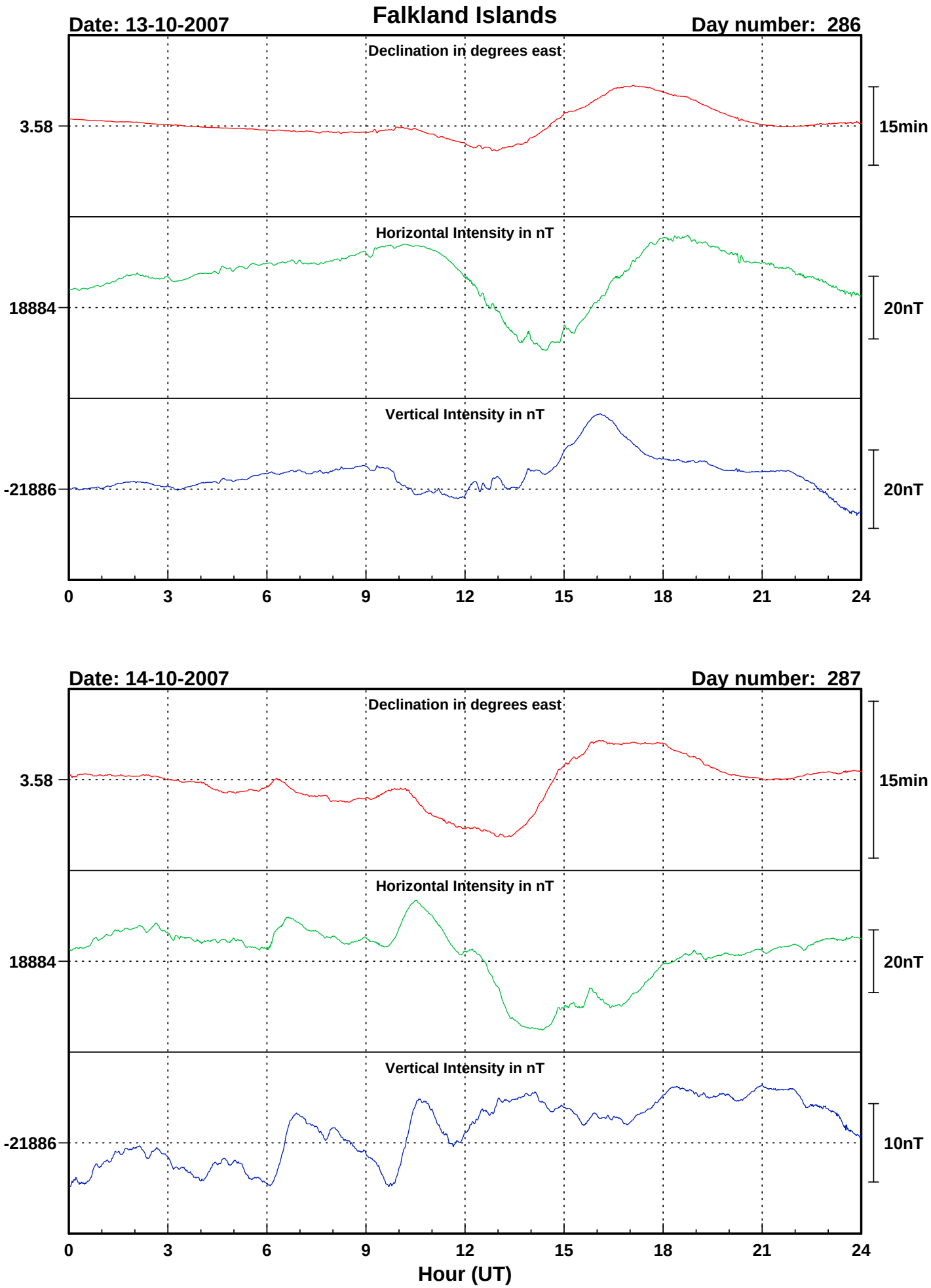
24
Hour (UT)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Day number: 286
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
20nT
0
3
6
9
12
15
18
21
24
Date: 14-10-2007
Day number: 287
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
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6
9
12
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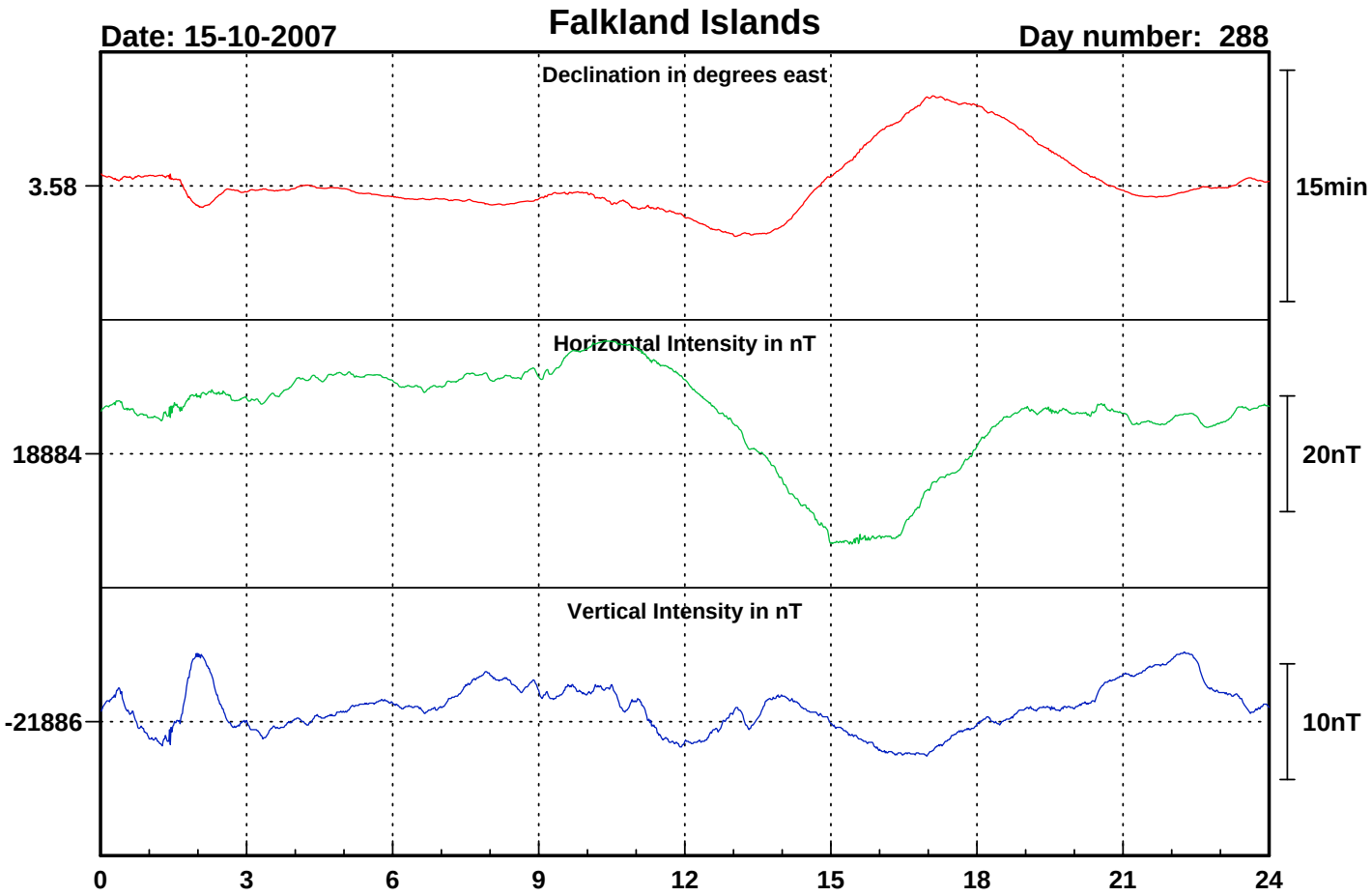
18
21
24
Hour (UT)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Day number: 288
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
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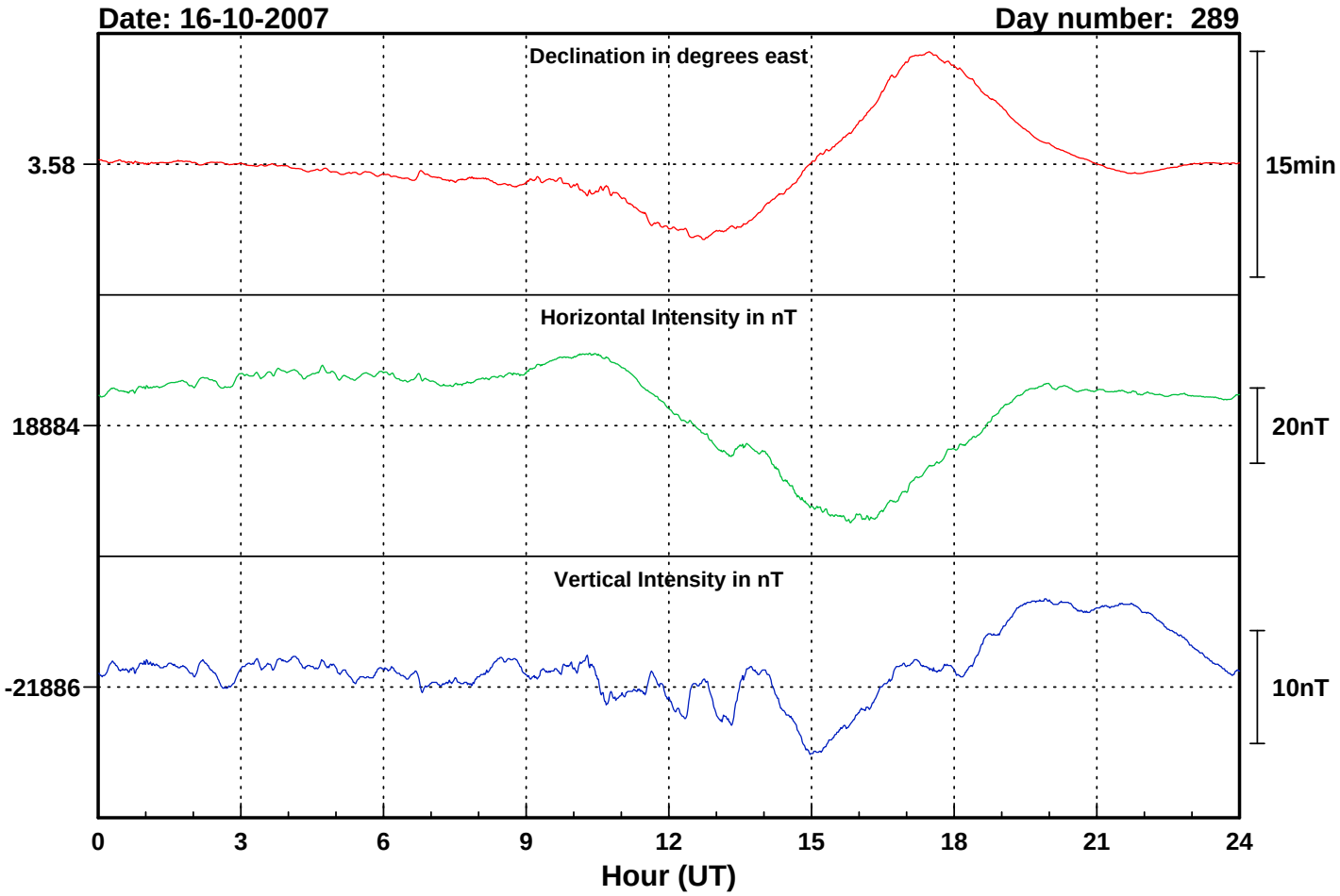
24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Day number: 289
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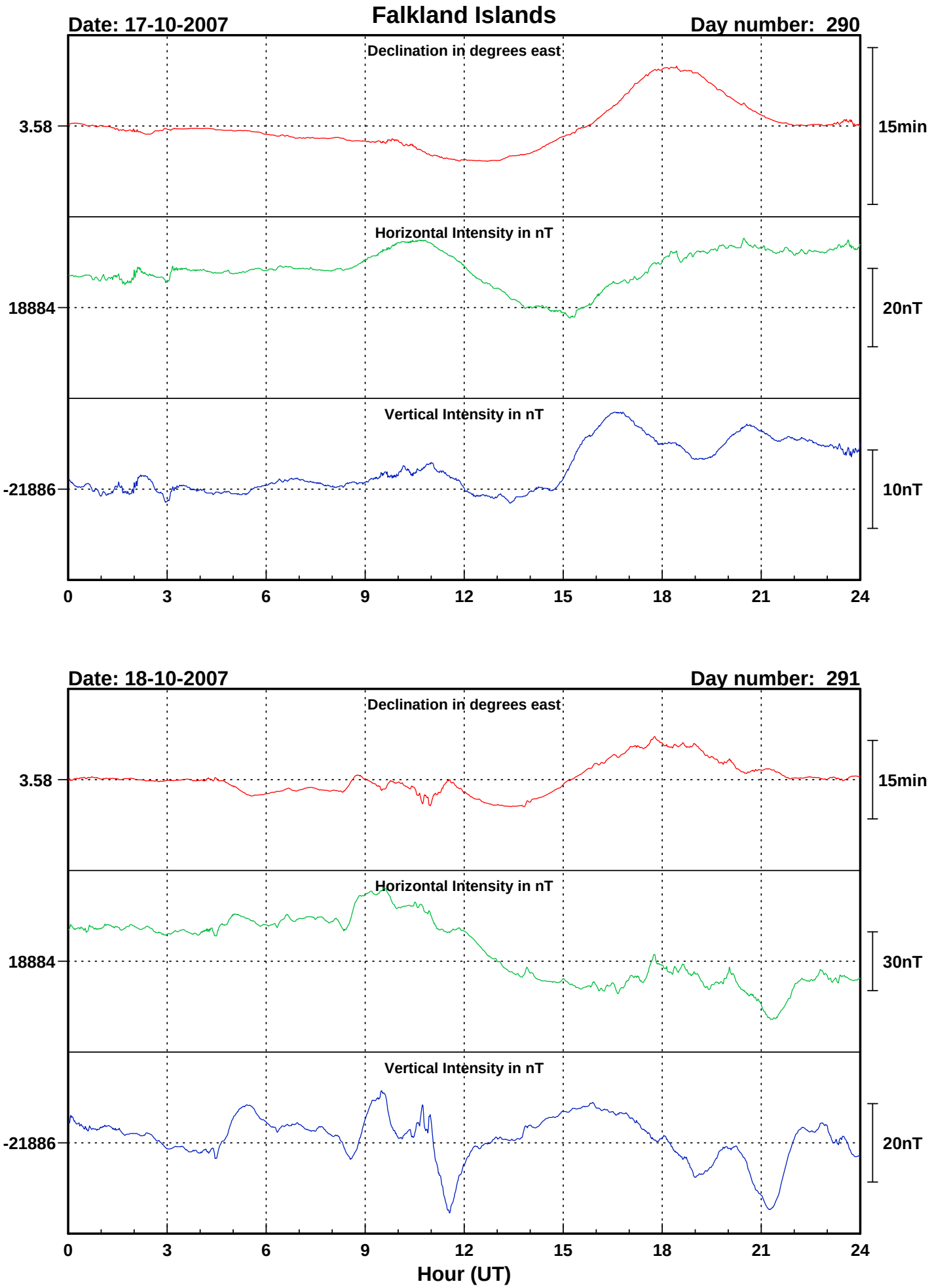
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Hour (UT)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Day number: 290
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Date: 18-10-2007
Day number: 291
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
30nT
Vertical Intensity in nT
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20nT
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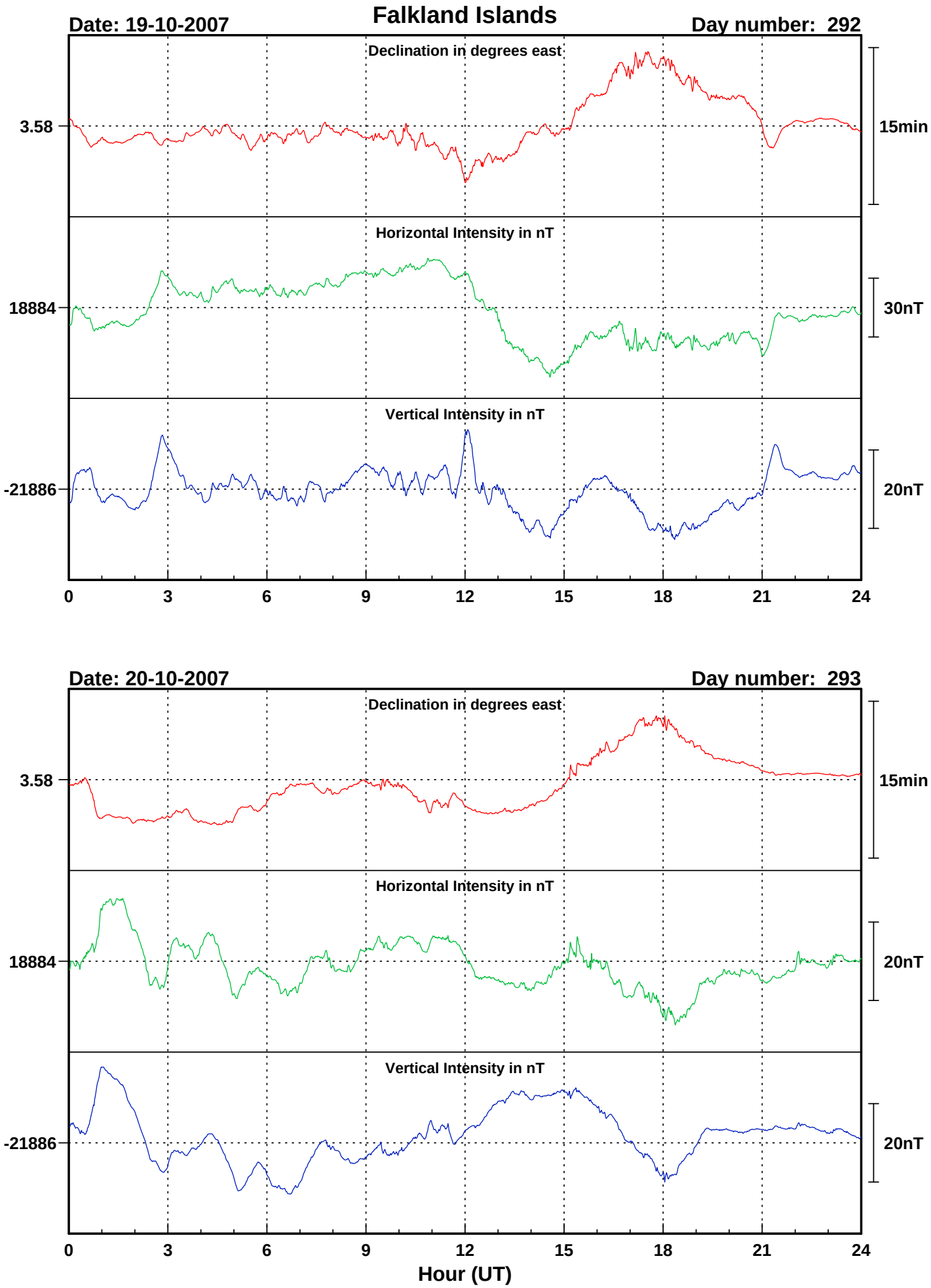
6
9
12
15
18
21
24
Hour (UT)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15min
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18884
30nT
Vertical Intensity in nT
-21886
20nT
0
3
6
9
12
15
18
21
24
Date: 20-10-2007
Day number: 293
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
20nT
0
3
6
9
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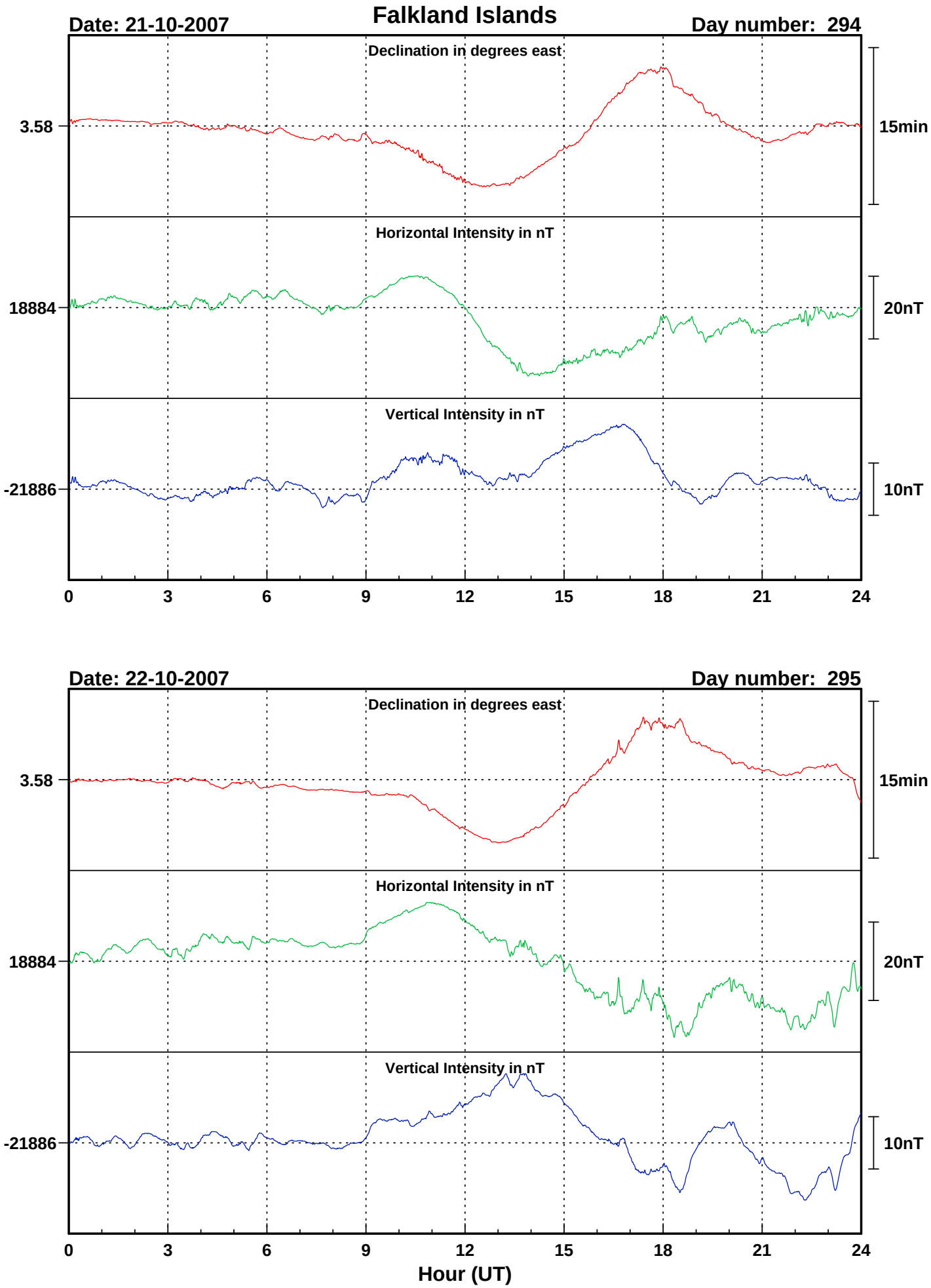
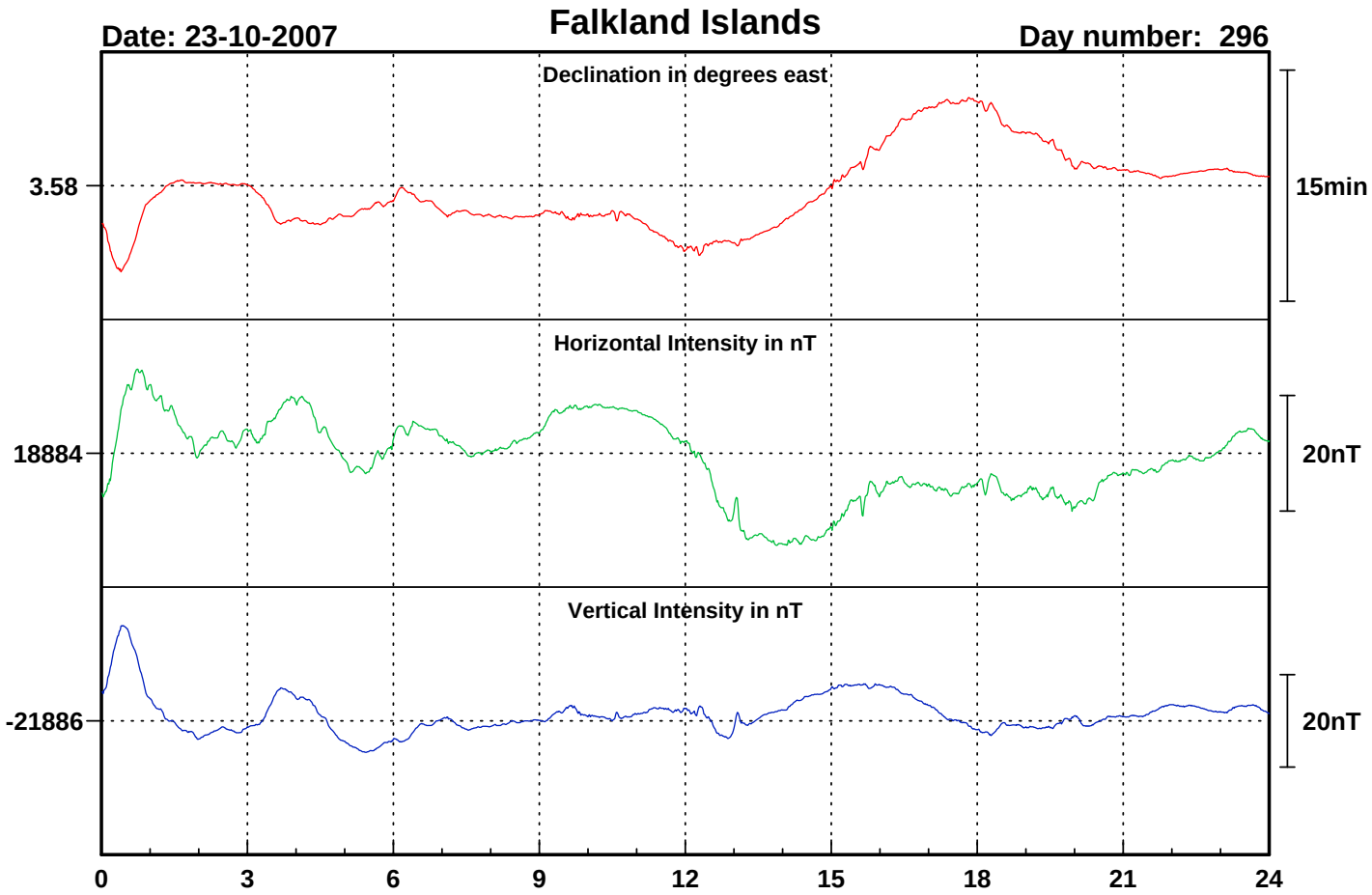
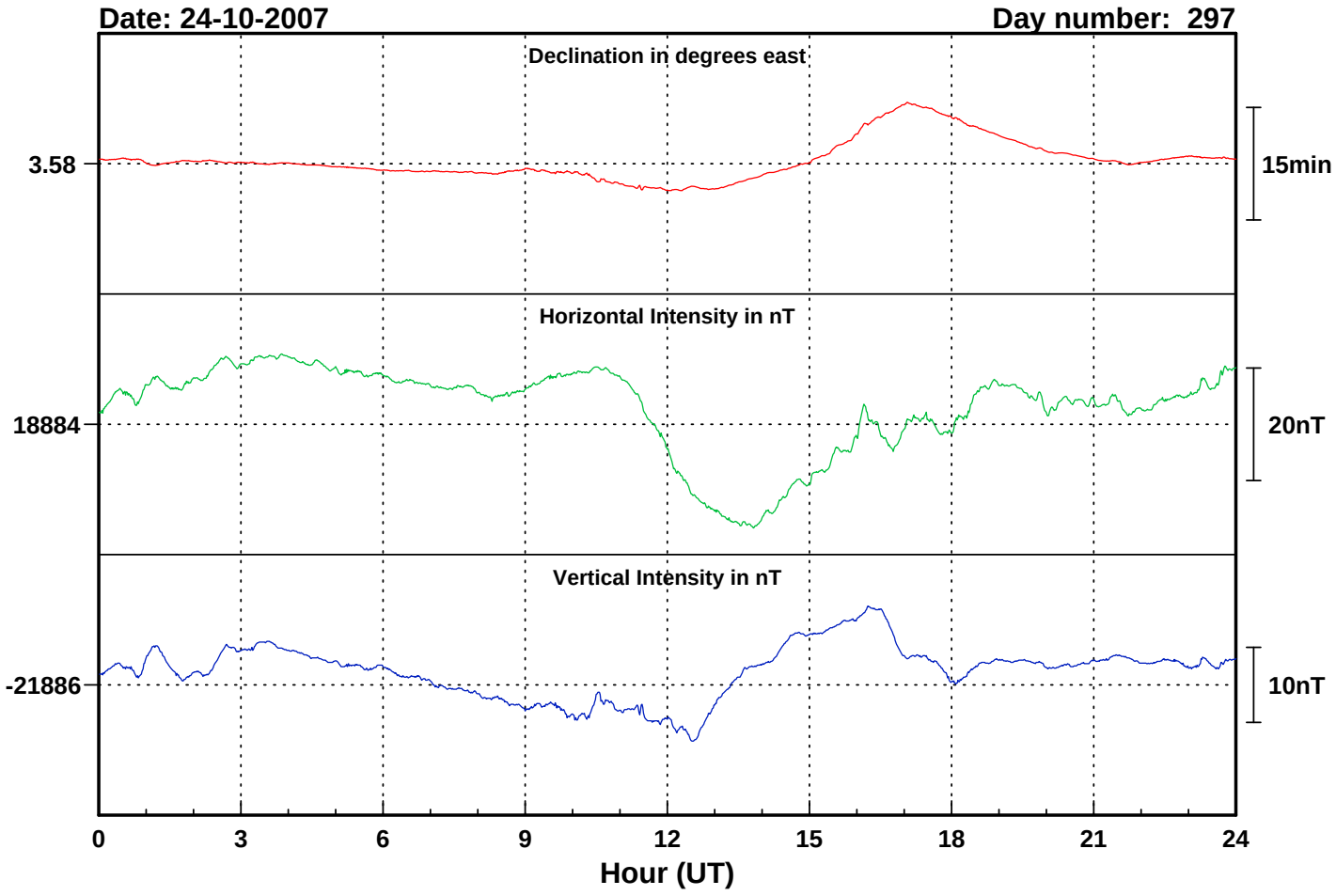
18
21
24
Hour (UT)


Falkland Islands
Date: 21-10-2007
Day number: 294
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Date: 22-10-2007
Day number: 295
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Hour (UT)


Falkland Islands
Date: 23-10-2007
Day number: 296
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
20nT
0
3
6
9
12
15
18
21
24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Day number: 297
Declination in degrees east
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15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
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10nT
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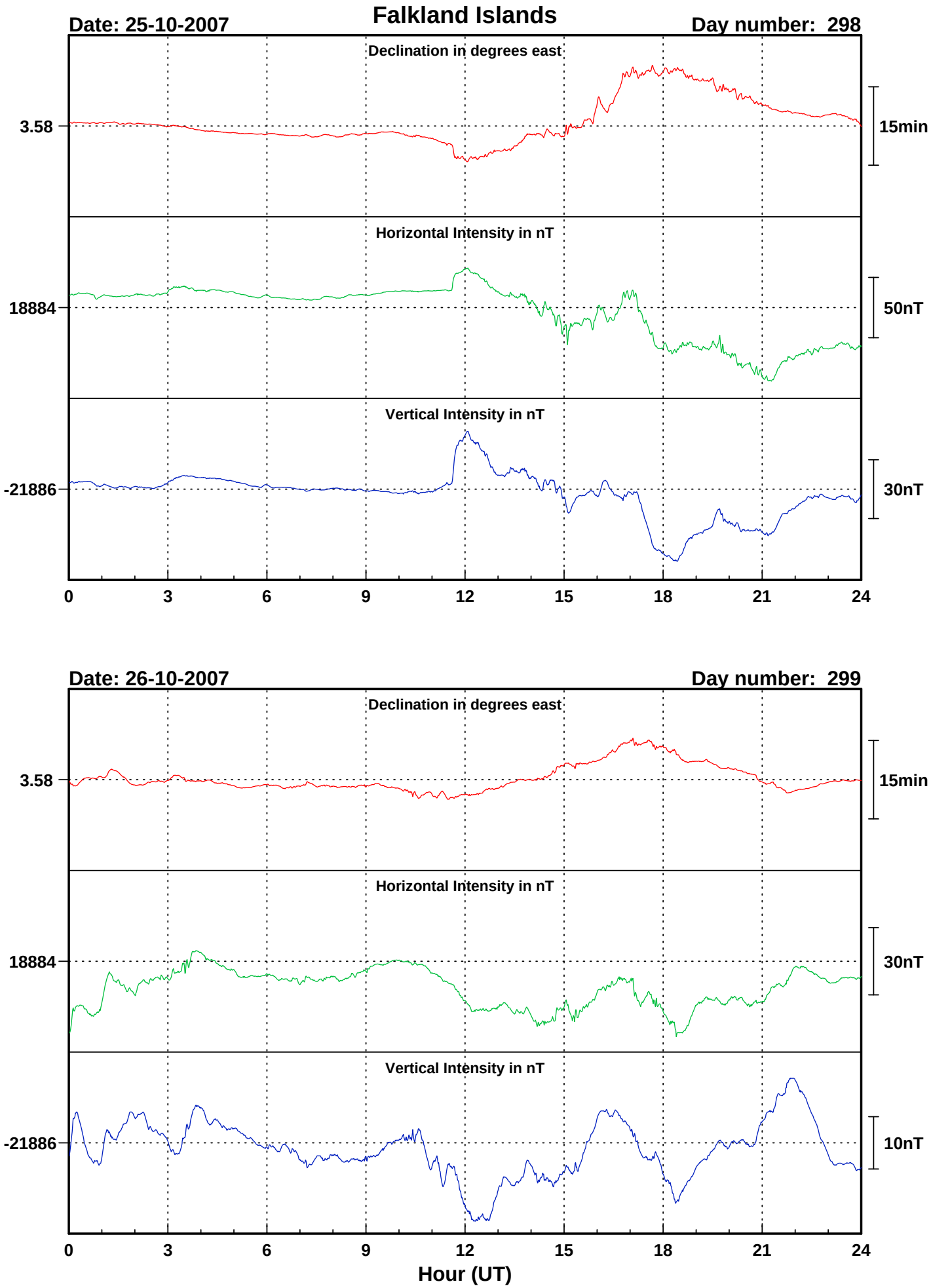
6
9
12
15
18
21
24
Hour (UT)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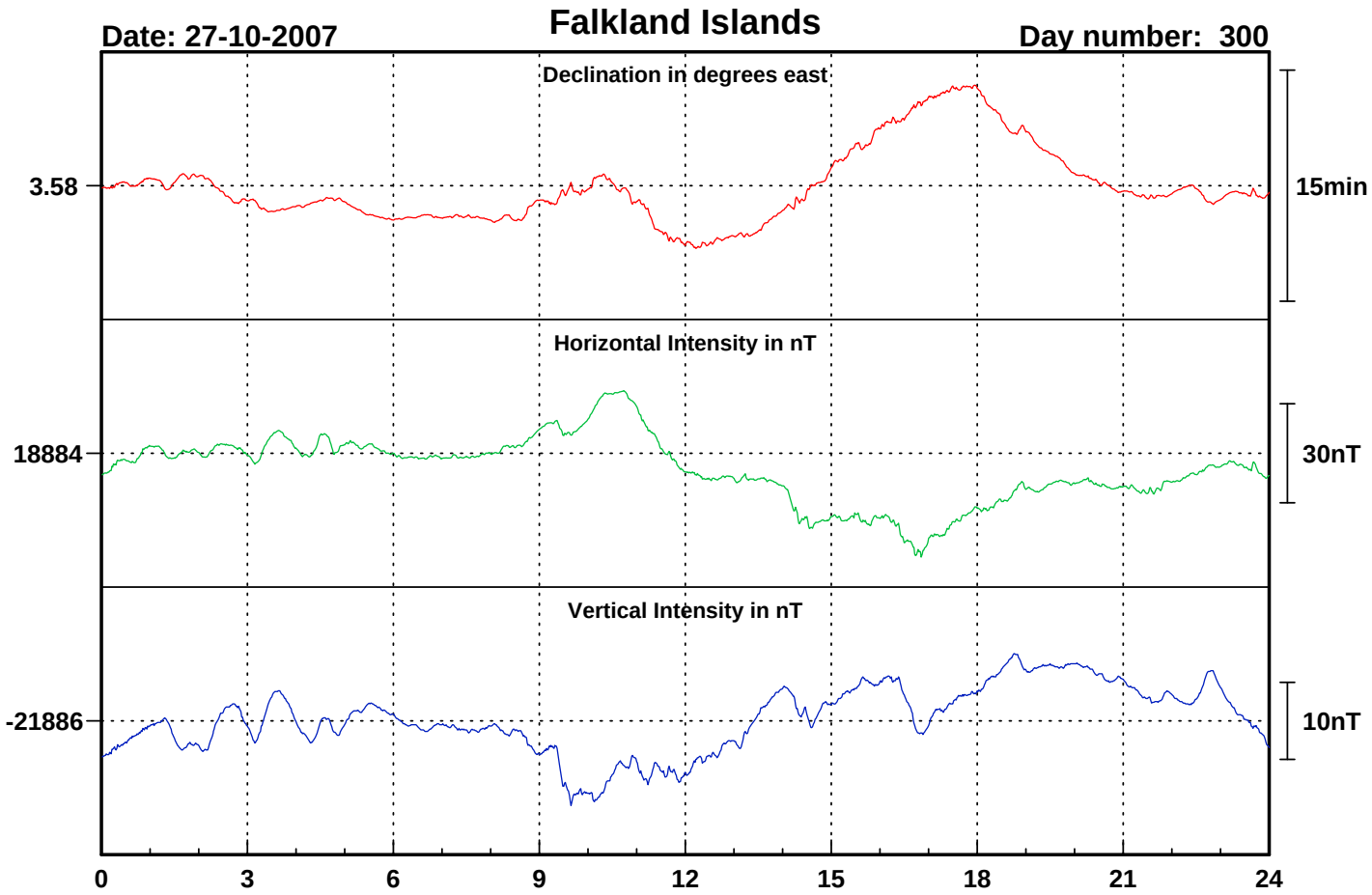
Date: 25-10-2007
Day number: 298
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
50nT
Vertical Intensity in nT
-21886
30nT
0
3
6
9
12
15
18
21
24
Date: 26-10-2007
Day number: 299
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
30nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Hour (UT)


Falkland Islands
Date: 27-10-2007
Day number: 300
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
30nT
Vertical Intensity in nT
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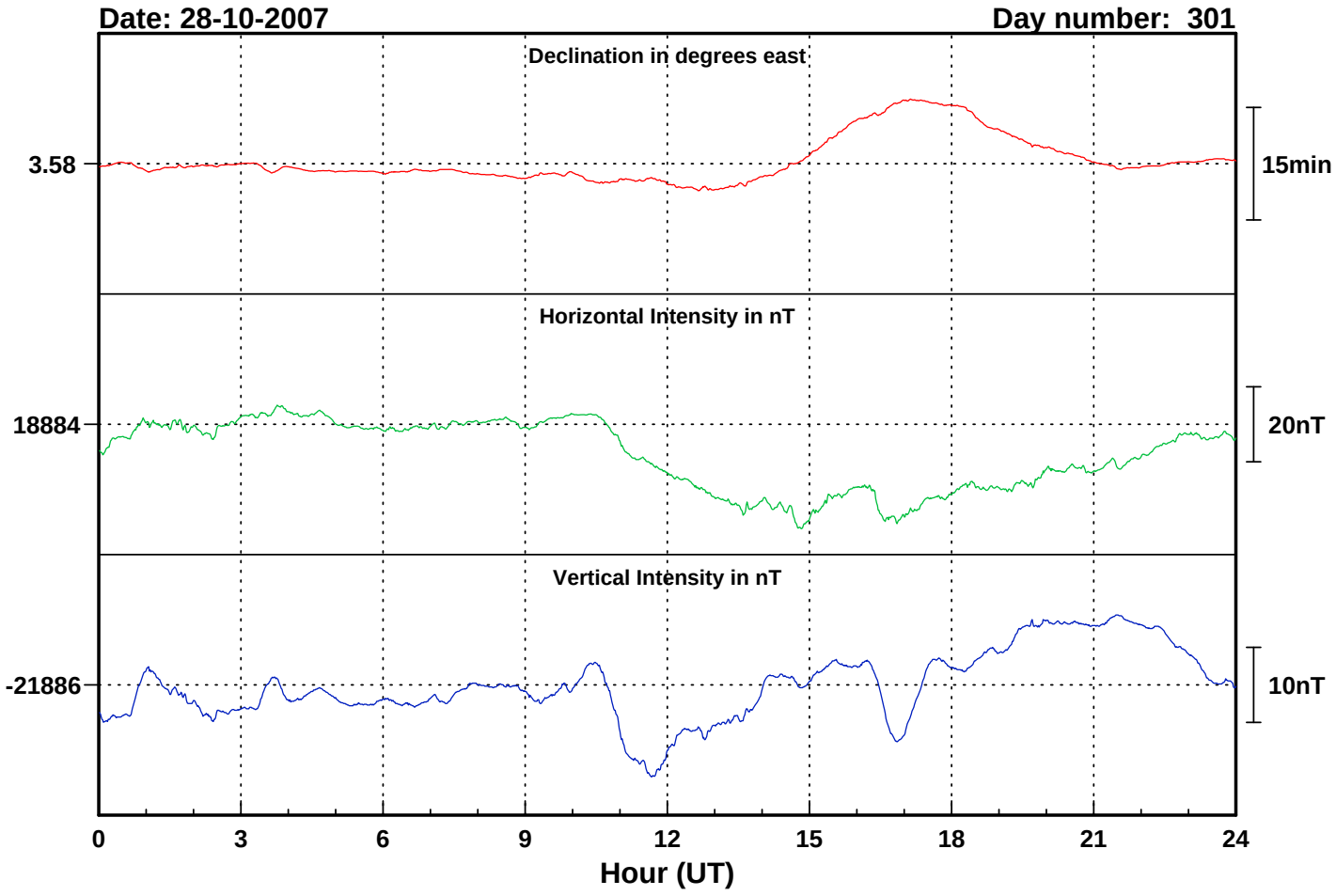
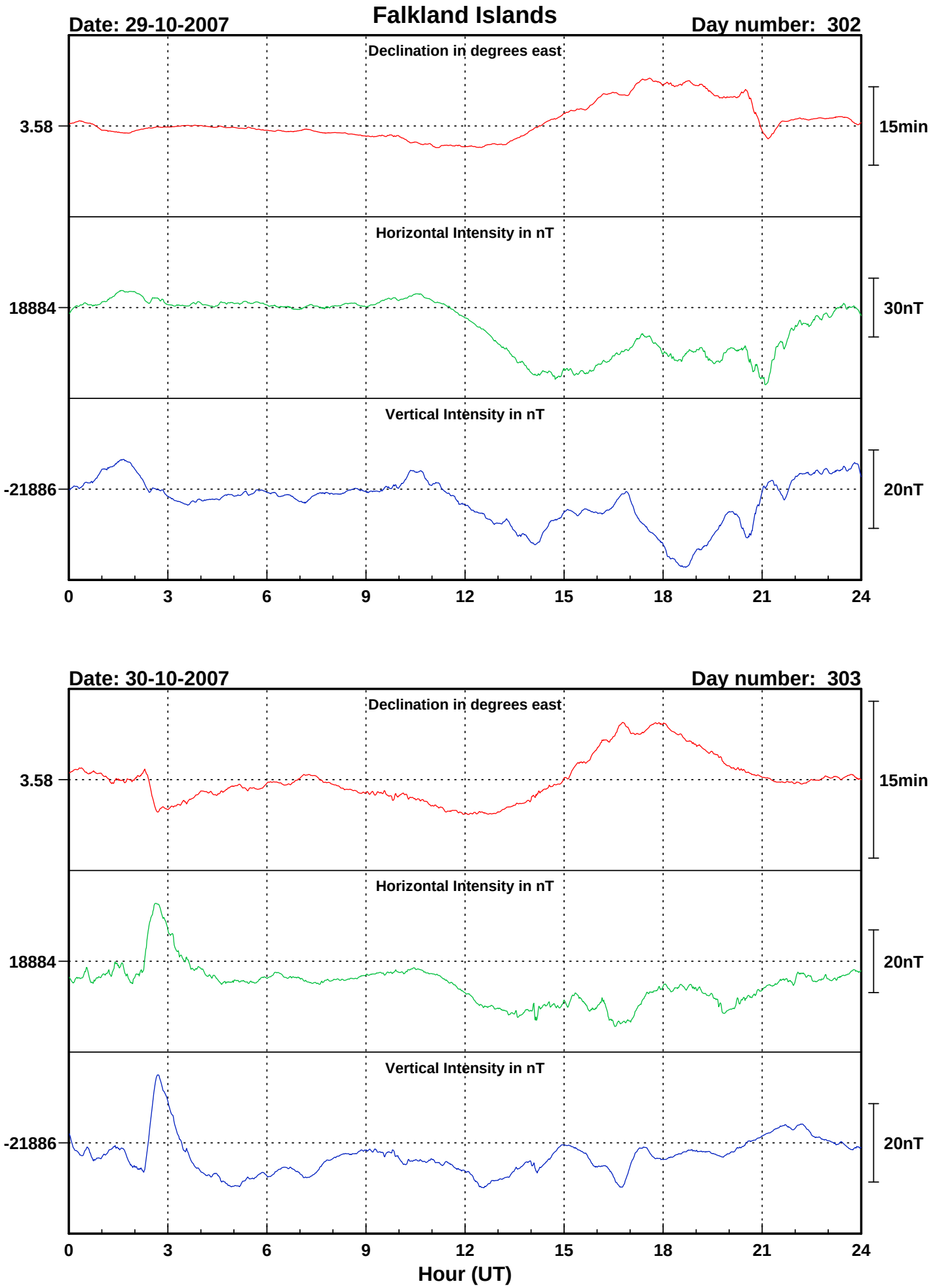
10nT
0
3
6
9
12
15
18
21
24


Date: 28-10-2007
Day number: 301
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24
Hour (UT)


Falkland Islands
Date: 29-10-2007
Day number: 302
Declination in degrees east
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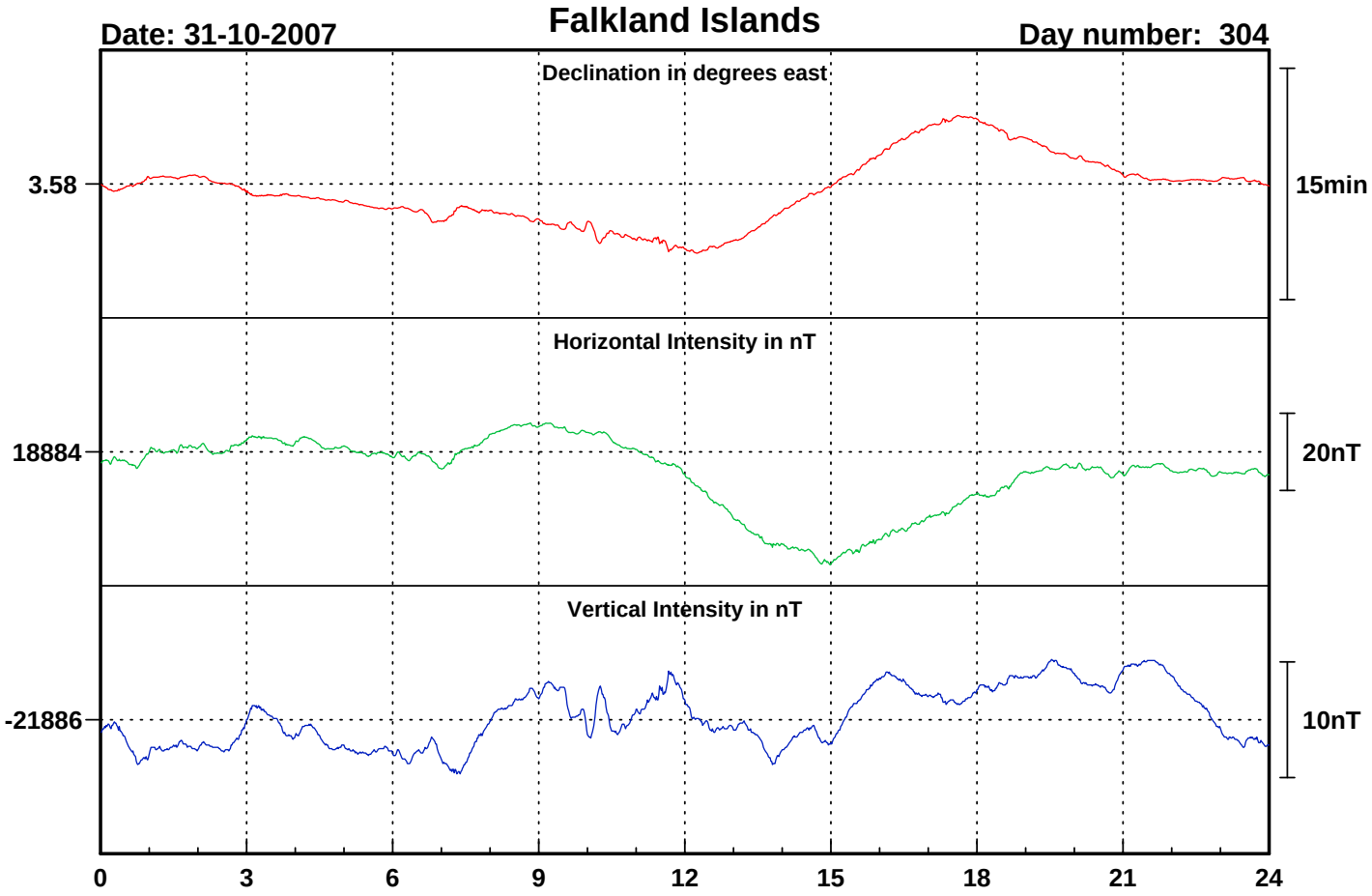
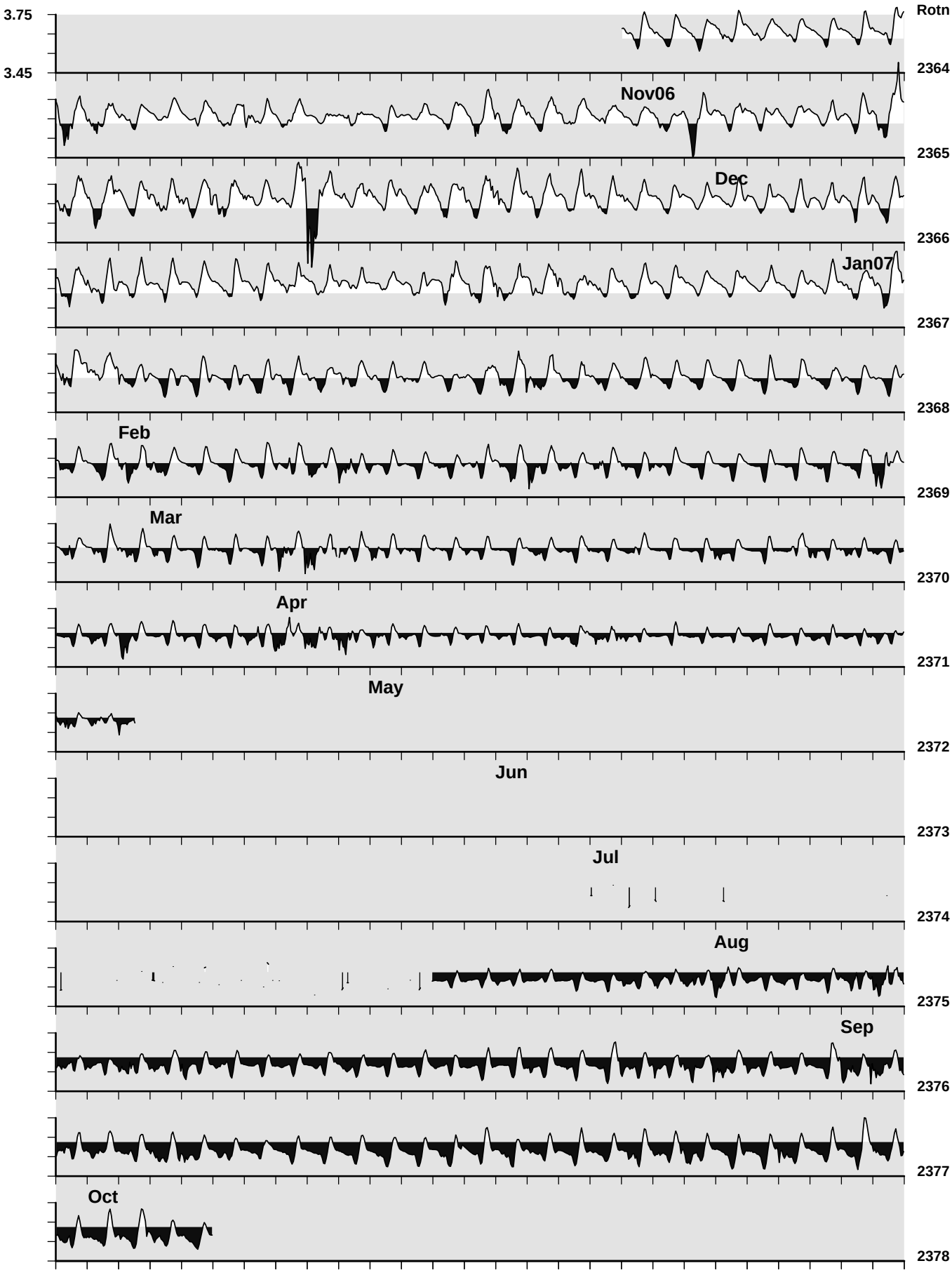
15min
Horizontal Intensity in nT
18884
30nT
Vertical Intensity in nT
-21886
20nT
0
3
6
9
12
15
18
21
24
Date: 30-10-2007
Day number: 303
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
20nT
0
3
6
9
12
15
18
21
24
Hour (UT)

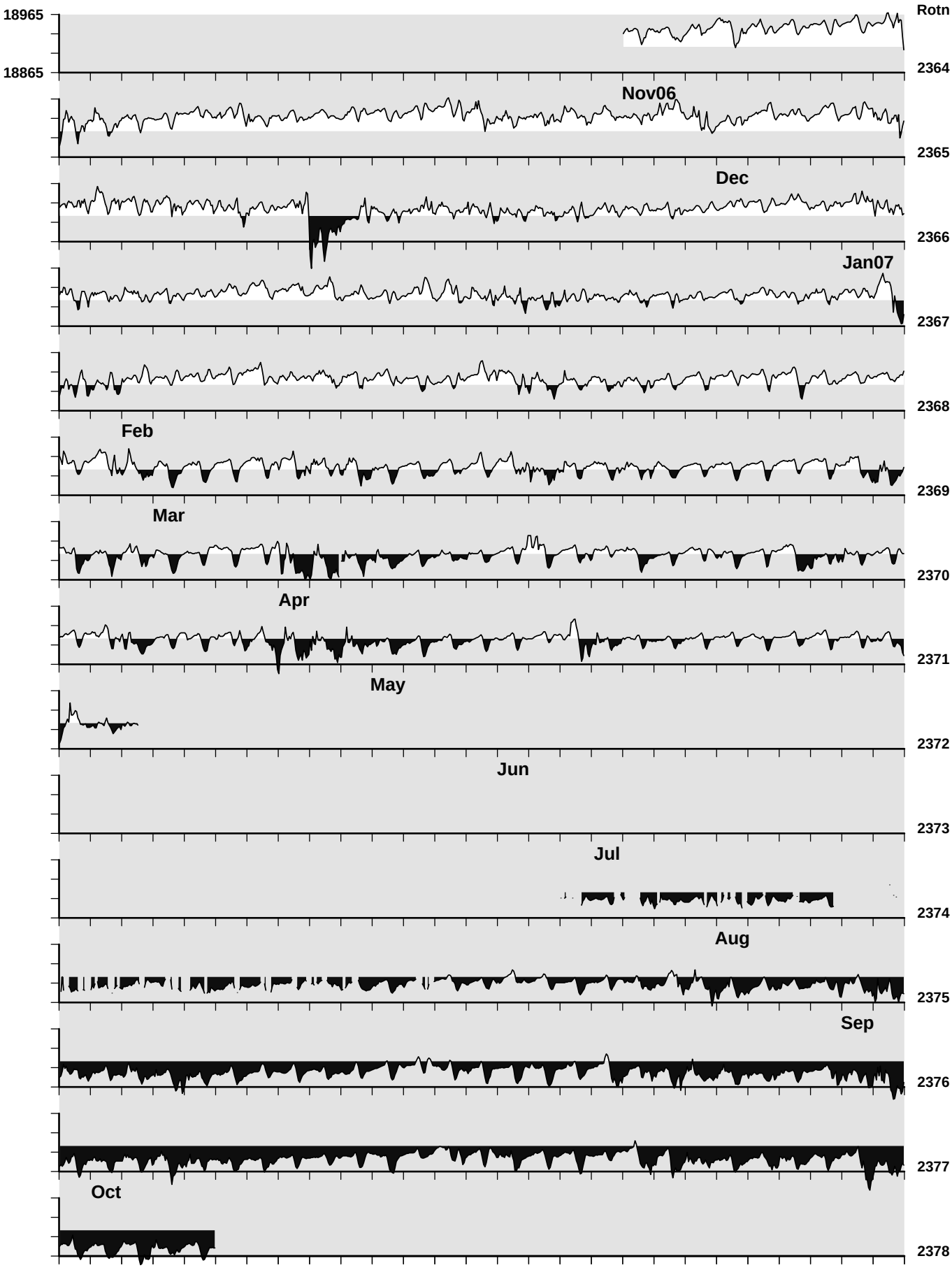

Falkland Islands
Date: 31-10-2007
Day number: 304
Declination in degrees east
3.58
15min
Horizontal Intensity in nT
18884
20nT
Vertical Intensity in nT
-21886
10nT
0
3
6
9
12
15
18
21
24

Falkland Islands Observatory: Declination (degrees)



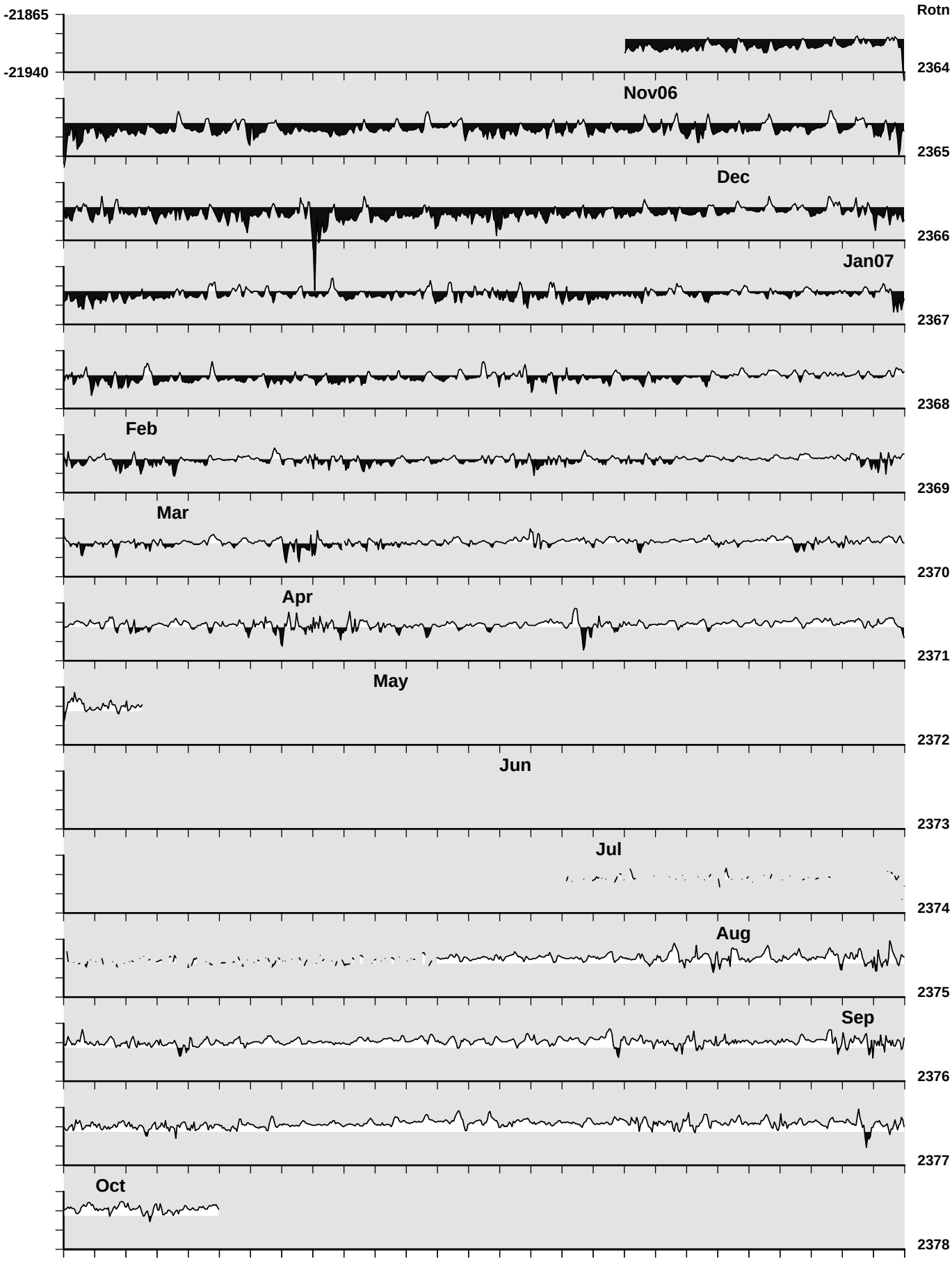
Hourly Mean Values Plotted By Bartels Solar Rotation Number

Falkland Islands Observatory: Horizontal Intensity (nT)



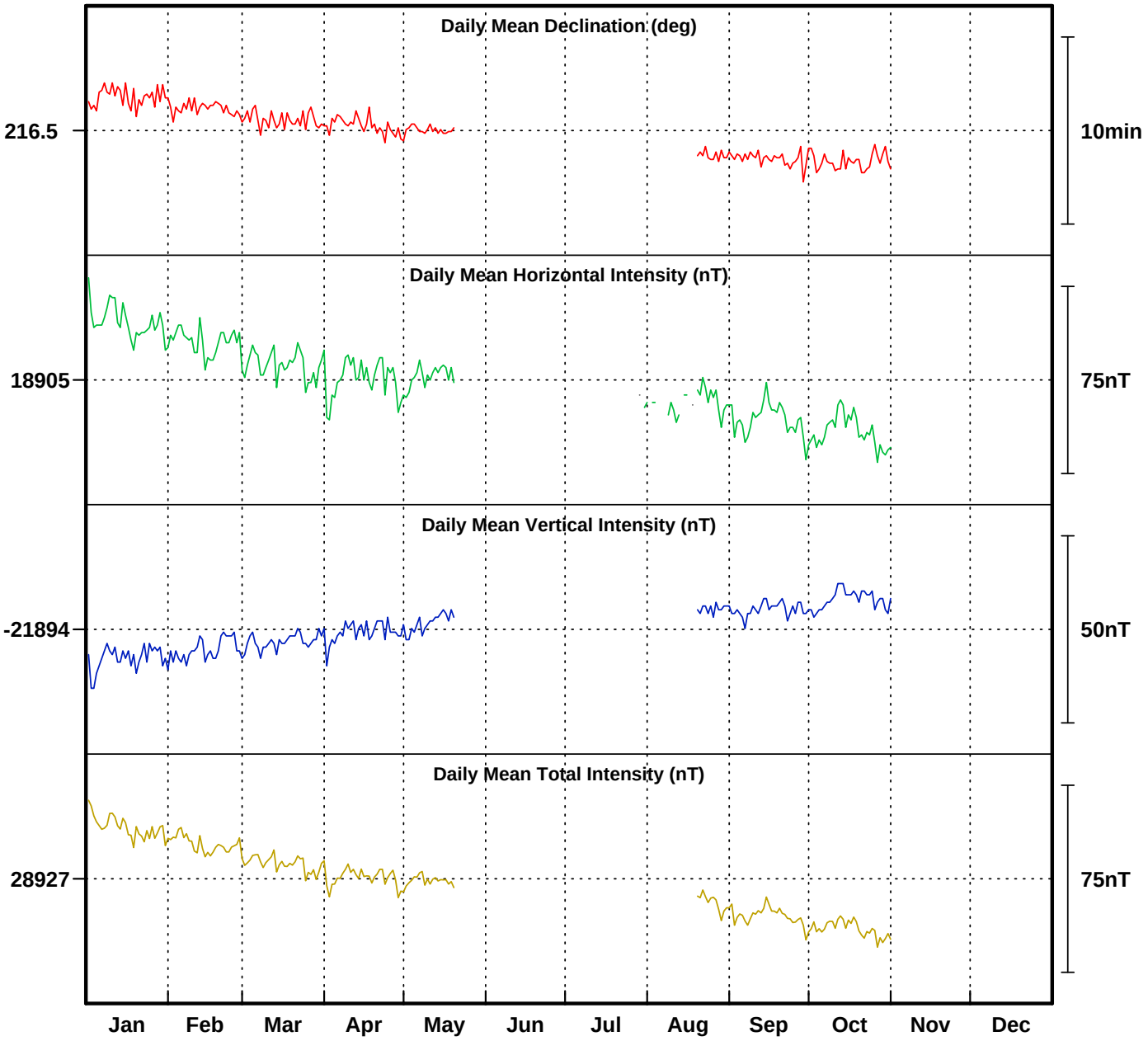
Hourly Mean Values Plotted By Bartels Solar Rotation Number

Falkland Islands Observatory: Vertical Intensity (nT)



Hourly Mean Values Plotted By Bartels Solar Rotation Number

Falklands Is Observatory 2007



Monthly Mean Values for Port Stanley Observatory 2007

Month	*D*	*H*	*I*	*X*	*Y*	*Z*	*F*
January	3° 38.2´	18928 nT	-49° 9.9´	18890 nT	1201 nT	-21902 nT	28948 nT
February	3° 37.6´	18920 nT	-49° 10.5´	18882 nT	1197 nT	-21900 nT	28941 nT
March	3° 37.0´	18911 nT	-49° 11.1´	18873 nT	1193 nT	-21897 nT	28933 nT
April	3° 36.7´	18905 nT	-49° 11.5´	18868 nT	1191 nT	-21895 nT	28927 nT
May	3° 36.5´	18907 nT	-49° 11.1´	18869 nT	1190 nT	-21892 nT	28927 nT
June	********	********	********	********	********	********	********
July	********	********	********	********	********	********	********
August	********	********	********	********	********	********	********
September	3° 34.9´	18889 nT	-49° 12.5´	18852 nT	1180 nT	-21889 nT	28912 nT
October	3° 34.8´	18884 nT	-49° 12.7´	18847 nT	1179 nT	-21886 nT	28907 nT

Note

i. There are no monthly mean values between Jun –Aug 2007. This was due to a faulty media converter. Normal observatory operations were restored on 19th Aug 2007.

ii. The values shown here are provisional.